THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

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By order of the Directors,
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Gas-Works, Old Kent Road, Sept. 14, 1858.

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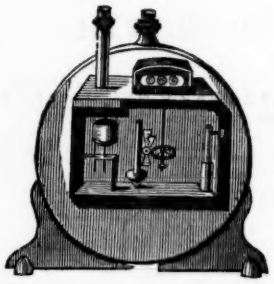

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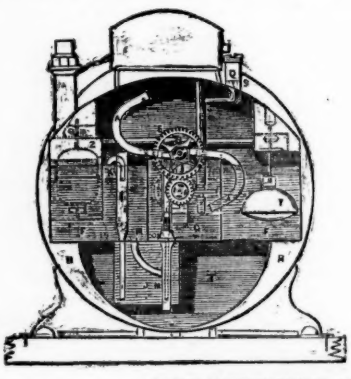

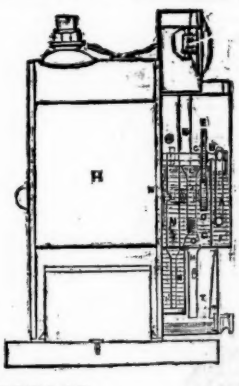

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TO CORRESPONDENTS.

J. K. H.—*It is impossible to form any opinion without knowing the lengths and diameters of the mains, and the quantity of gas annually consumed, with the average pressure under which it is distributed.*

NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, Sept. 28, and the subsequent numbers on each successive alternate Tuesday.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, SEPTEMBER 14, 1858.

NOTES UPON PASSING EVENTS.

OUR able contemporary, the *Saturday Review*, in the course of some judicious remarks on the case of *Scott v. Dixon*, very properly observes, firstly, that the Common Law has, in this instance, proved to be far more efficacious to repress, or at least to punish, the frauds of Directors of Insolvent Companies than the empirical lawmongering of the present day; and then it proceeds to draw the very correct inference that the Common Law, being based on broader general principles, must be far more universal in its application than any special code can be. In other words, this is the truth which such men as Mr. C. P. Cooper (without faith) and Mr. Toulmin Smith (with a deep, earnest conviction) have been struggling for years to bring into evidence, and which we ourselves have laboured to diffuse. It is, therefore, to us a source of unmixed satisfaction thus to find the most philosophical and the soundest organ of the thinking men amongst the rising politicians, bold enough to stigmatize as it deserves the specious humbug of Codification which has for so many years been held up for our admiration by the Benthamite school. One of the most mischievous tendencies of the Association for the Promotion of Social Science is, indeed, we believe, to be found in the creation of a fictitious demand for a law reform based upon such a system; and, moreover, there seems to be strong reason for suspecting that the result of all such peripatetic attempts to diffuse either science or moral philosophy must produce equally unsatisfactory results. For it is to be observed that the men who thrust themselves into the leading positions amongst the organizers of such associations are invariably persons who have cultivated their understandings to the great detriment of their reason, even when, for charity's sake, they are assumed to be honest; and certainly the proposals which were the most favourably received at Birmingham last autumn, the papers which were received with the most applause, were precisely those which were at the same time characterized by the absence of primary truth, or a clear perception of the principles connected with their respective subjects. We will revert to this discussion as to the result of wandering associations on some future occasion, and perhaps the forthcoming gathering at Liverpool may furnish an occasion for so doing. At present we wish particularly to call the attention of those of our readers who look beneath the surface of things, to the important fact that all the recent statutes made and provided for the punishment of fraudulent directors have proved on trial to be utterly useless, so carelessly or so ignorantly were they framed; whilst the Common Law, so much abused by the men who are unable to understand or too indolent to study it, has been proved to be sufficient for all the purposes the new statutes were designed to fulfil. There is, it now appears, an efficient method of checking the dishonesty and crimes which have of late years so materially damaged the faith of our public in commercial companies; and we are convinced that ultimately it would be for the interest of all parties to enforce the rigorous application of the law.

It is singular, however, to observe that, precisely at the time that the leaders of the Brummagem Association for the Advancement of Social Science are striving to create an excitement in favour of Centralization and Codification,—for it is to be observed that the two principles are so closely allied as to render their separate existence impossible,—our French neighbours are beginning to feel the dangers and inconveniences of the former, and are practically demonstrating the grand philosophical error on which the latter is based. The speech of M. de Morny is one of the most extraordinary commentaries on the system which, however, alone renders possible the government with which he himself is connected. It is a fact that in France a man can in hardly any case do what he likes with his own, so far as real property is concerned; but if he should wish to build, to sink a well, to make a road, or to open a quarry, a mine, or a gravel pit, he must, as a primary condition, refer all his plans to the criticism and the approval of the various departments of the State at Paris: too happy if, even in a small affair, he should not be compelled to consult them all. There was a striking illustration of this system in the execution of the works for the removal of the fœcal matters from Paris. They were designed by the Engineers of the Ponts and Chaussées entrusted with the direction of the municipal works; they were submitted to the Town Council and to the Prefect. Then the plans were sent to the Minister of the Interior, to the Minister of Public Works, to the Minister of Commerce, and to Commissions innumerable; so that a longer time was actually wasted in the journeys between the various offices than was required for the execution of the works. Well, indeed, may M. de Morny grumble at this paternal guidance, and it is by no means strange that he should sigh for the opportunity of exerting "the plenitude of his manhood." But, seriously, may we not ask whether the modern schemes for "guiding" local authorities, as our would-be centralizers eupheuistically call their interference, is not as vexatiously and utterly absurd? What good end is served by rendering it necessary to obtain the consent of the Secretary of State, of the President of the Board of Health, or of the Vice-President of any Committee of Council, to the operations which are required in any locality, and about which the dwellers in the particular locality ought to be the best judges? Does our official supervision prevent follies or blunders? The history of the late Board of Health is before us, and the shameful nonsense of official Blue-books confirms the suspicion which that history gives rise to—viz., that the first condition for being employed by the Government of this country, in scientific matters, is to know nothing at all about them. A little learning is said to be a dangerous thing; and so official intellects protect themselves by perfect ignorance.

The Report upon the Netley Hospital lately issued by the War Office is a strange confirmation of the very poor opinion we thus record of our Governmental professional advisers; or, at any rate, it is a singular illustration of the ease with which so-called scientific evidence can be obtained "to order." Thus the rather loose statement of Mr. S. Herbert's Committee, "that it is well-known that the mixture of fresh water with sea-water in tidal estuaries is a common source of malaria, especially in hot weather," is not met by a direct denial, or by a philosophical statement of the facts of the case;

but it is parried with a kind of Old Bailey skill. Mr. Herbert's committee erred in attributing the evil solely to the mixture of the salt with the fresh water, because malaria does not arise from the waters, but from the alluvial deposits of tidal estuaries; and the War Office authorities studiously avoid any allusion to the enormous area of the mud banks which surround Netley and Southampton. Indeed, the cool assertion of those equivocal authorities, "that Mr. S. Herbert's Committee were mistaken in stating that the mud banks near Netley were seven-eighths of a mile in width, when the total width of the estuary was only 1¾ of a mile," could, it is to be suspected, only be tolerated in an official document. Every one who knows Southampton Water must know that Mr. Herbert has in no wise exaggerated the proportions of the mud banks of that estuary. As to Mr. Ranger's opinion that "no possible danger can arise from this source," we would simply observe that there is, on the contrary, a moral certainty that, if the towns lying above Netley on the Test and the Itchin be not compelled to deodorize their sewerage, the quality of the mud in the Southampton Water—exposed as the latter is to the peculiar action of the double tide—must become yearly more and more injurious. The replies to the other objections of Mr. Herbert's Committee, as to the climate of this neighbourhood, are equally unsatisfactory; but they are of the usual Governmental stamp. Thus great stress is laid on the fact that the mortality in the parish of Hound, in which the new Hospital is situated, is only 18 per 1000, but no allusion whatever is made to the fact that the poor patients from that parish resort to, and swell the mortality of the Southampton hospitals and infirmaries, but also by the same process diminish the apparent mortality of their own parish. It is, however, more to the disingenuous, unscientific manner in which the objections of Mr. Herbert's Committee to the climate of Netley Hospital are met that we object, than we do to the substantial conclusion of the advocates of the War Office on this score. For many constitutions, and for many of the diseases soldiers are exposed to, we believe that the climate of the banks of the Southampton Water is very suitable; but the proper mode of proving this position is certainly not to ignore the existence of the very foul mud banks which disfigure that otherwise beautiful estuary at low tides, or to attempt to show that the alluvial mud mixed with the deposit from the sewerage of such towns as Southampton, &c., is innocuous; whilst the very same parties who have engaged in this strange attempt have been amongst the most energetic denouncers of the evils arising from the mud of the Thames. Truly, old fables will always hold; and official science, like the woodman in the tale, will continue to blow hot and cold to the end of the chapter. The funniest part of this Report is, however, to be found in the assertion that the brick earth of the neighbourhood of Netley is porous, or "little retentive of water;" for, from our own personal knowledge of the clays intercalated in the strata covering the blue tertiary clays of the Hampshire basin, we are able to state that most of them make admirable puddle.

But, really, the great question connected with this Netley Hospital is whether the plan on which it is built (for observe, good taxpayers! the works are said to be going on whilst the inquiry itself is proceeding; so that even if the Hospital should prove to be useless, you must pay the bill all the same) be, or be not, the correct one. A large majority of *independent* medical and architectural authorities state distinctly that the wards of hospitals ought to be ventilated by means of windows opposite to one another, and communicating directly with the open air; and certainly the experience of foreign nations accords with the conclusions of the persons thus cited. But the new Hospital is designed to have windows only on the north-east side of the wards, with doors *not* immediately opposite to them, and communicating with a corridor giving access to other wards, and having windows towards the south-west. Now, in this case the foul air from the wards must be carried into the corridors; for the latter being, from their exposition, warmer than the wards, the vitiated air from them must pass into the corridors, to the annoyance of the patients supposed to be amusing themselves there, or it may be dispersed through the other rooms. We read of "ventiducts" and other contrivances (with names equally neological and uses equally equivocal) for the purpose of remedying the recognized defects of the originally bad system of construction; but we suspect, from the tone and manner of the "talented" suggestions made for the purpose of improving the ventilation, that the common sense of the business would have been to have wasted the whole of the money expended up to last spring, rather than to attempt to correct an irremediably bad design.

We may revert to this subject hereafter, but we cannot help observing that, in these days of middle-class examinations, of public competitions, &c., it is strange to find such men as Major Ravenhill and Mr. Ranger using the word *strata* in the singular number. This is only one illustration of the bad grammar tolerated in high places; but the whole of the Report abounds with similar sins against literary propriety. Landing waiters who make such blunders are "shown up" in reports on Civil Service examinations!

At Liverpool there would appear lately to have been some violent and rather unseemly debates in the Town Council upon the subject of Mr. Duncan's salary, and incidentally upon the loss of water from the Rivington Reservoirs. It requires a very vigorous faith in the excellence of the principle of Local Self-Government to enable us to read the reports of these discussions with patience; but we must add that they really, to us, at least, tend to substantiate the opinion we have always expressed, viz., that Town Councils are about the very worst parties, the State always excepted, to be entrusted with the management of a large Water-Work. In this case at Liverpool there has been a sad exhibition of petty jealousy, of party, and personal pique; and it will be fortunate for the town if it should escape from any serious consequences of their action. The debates, however, incidentally show that the quality of the waters at Rivington is improving, as we always said that it would do; for the experiments on filtration have been stopped: and, moreover, the debates again prove that the formation of large watertight Storage Reservoirs is a difficult and tedious operation—one in which it is impossible to dispense with the spontaneous and gradual development of the laws of nature.

The ill-feeling created by the very unfair and injudicious conduct of the Chadwickian puppets towards the Manchester City Council is far from having subsided; and the local journals from time to time continue to insert letters exposing the shameless recklessness of assertion, the utter indifference for truth, which have always characterized the persons who have for so many years afflicted the country. In one of the recent numbers of the *Manchester Guardian* we find, indeed, that Mr. P. Holland has actually boasted of his having privately waited upon Mr. Cowper, the President of the Committee which decided against the scheme submitted to Parliament last session by the Manchester Corporation, and made to him statements of a very extraordinary nature. Now, on this occasion Mr. Cowper was discharging judicial functions, and it was highly indecorous on his part to receive any suggestions from a person, the known advocate of certain opinions, whom he could easily have examined in a public and proper manner. The whole of this transaction is of a piece with the history of the Board of Health, and as such we commend it to the attention of the public. But we must call attention to a small mistake made in one of the letters of Mr. Alderman Clark, by which the present Honourable President of the Board of Trade is made to appear the person guilty of the impropriety fairly attributable to Mr. Adderley. Mr. Henley is far too well acquainted with his duty and with parliamentary etiquette ever to have forgotten himself to the same extent as Mr. Cowper did, and we are equally sure that he would never have adopted, as Mr. Clark appears to think that he has done, different principles in his public and in his private capacities. It was Mr. Adderley, in fact, who prevented the Corporation of Birmingham from doing that which he tolerates in countless other places; and he is charged with the guidance of the education of the country, be it observed, not with the direction of the Board of Trade!

The boring for water at Rugby has attained the beds of sandstone, after passing through the marls of the new red sandstone series. The stone was found at 780 feet from the surface, and there is now a probability of finding water. It is unfortunate that the diameter of the boring is so small, but of course this could easily be enlarged so as to receive a pipe. Whilst upon this subject, it may be worth while observing that the tales inserted in the public prints with respect to the Bourne Well are of very doubtful authenticity. Thus, it is said that the water flows to a height of 39 feet above the ground, from a 4-inch bore, at the rate of 540,000 gallons a day. Now, in order to discharge this quantity within the twenty-four hours, the velocity of flow must be at least 12 feet per second; and though it be not impossible for those conditions to exist in this well, we seriously question whether they do, because the outburst of the Bourne spring in the immediate neighbourhood

must diminish the hydrostatic pressure on the subterranean current. Mr. Pilbrow will, we hope, also allow us to remark, that he is diffusing an error when he talks of a water supply at the rate of 17½ gallons per head; his own experience must have taught him that, with the constant service, a quantity of from 30 to 40 gallons per head is usually required.

We observe also, from the columns of our respected contemporary, the *Bury Post*, that the wells in the high chalk lands of Suffolk and Norfolk have lately been unusually dry. The same thing has been observed at Sutton, near London, and indeed throughout the country; for there are many causes at work to affect the deep-seated springs. The improvement of the surface drainage has, in the first place, diminished their supply, by carrying off much of the water which formerly passed through the upper strata. In the second place, we have had of late an extraordinary succession of dry years; and in the third, the great number of pumping-engines which have recently been erected must diminish the supply of the wells situated nearly at the apex of any water-bearing stratum, when, especially as in the case of the town of Bury, the area of back or feeding country is, comparatively speaking, small.

Circular to Gas Companies.

Having, in our last number, discussed Mr. Hills' claim to the use of hydrated oxide of iron for purifying coal gas from sulphuretted hydrogen, we have now to consider his second and distinct claim to be the discoverer of the process of revivifying the spent oxide by exposing it to the action of air. The evidence upon this head is altogether of a very conflicting and painful nature; but it seems perfectly clear from official documents that Mr. Laming was acquainted with the process in 1848, and that Mr. Evans independently discovered it in August, 1849, prior, of course, to the date of Mr. Hills' patent —namely, November, 1849. Thus, when Mr. Hills took out a previous gas patent in 1848, he was opposed by Mr. Laming, who furnished Mr. Newton, his patent agent, with a manuscript paper of objections. Mr. Newton went before the Attorney-General with Mr. Laming on the 15th of September, 1848, and from that paper he read the following passage:—

Recovery of some of the purifying re-agents for repeated use.—For this purpose I simply expose to the air the sulphuret of iron which results from the purification of illuminating gas by *hydrated peroxide of iron*. This exposure causes it to change back again chiefly into peroxide of iron, and partly into sulphate of iron.

This circumstance was sworn to by Mr. Laming and Mr. Newton, and the manuscript was produced in court with the following attestation, which Mr. Newton swore to having written on the day in question:—

These particulars were read by me before the Attorney-General in opposition to Mr. Hills' invention.
Sept. 15, 1848. A. V. Newton.

In the next place a French patent was granted to Mr. Laming on the 22nd of February, 1849, from his specification of which the following paragraph is translated:—

The sixth part of this invention consists in revivifying the hydrated oxide of iron after it has been converted into hydro-sulphuret, by its use for the purification of illuminating gas; for which purpose I expose it to the action of atmospheric air.

Lastly, Mr. Laming, in July, 1849, applied to the Chartered Gas Company for leave to try his process upon their works at Westminster. Leave was granted him, and experiments were made in August and the subsequent months under his direction. Mr. Laming furnished a reddish-coloured mixture of hydrated oxide of iron and chloride of calcium, together with sawdust, which Mr. Evans, the superintendent, employed in the experimental purifiers. It appears that Mr. Laming, intending to preserve his secret of revivification and to remove the material at once from the works after it had ceased to purify, until he had made a good bargain with the company for the purification of their gas, gave no information to Mr. Evans upon the subject of revivification. During his temporary absence, however, Mr. Evans had some of the used material, which was then of a black colour, taken out of the purifiers and thrown upon the ground; but observing that, after this exposure to the air, it acquired its original red colour, he re-introduced the renovated material into the purifiers, and found that it again purified excellently; and this alternate use and exposure were frequently repeated. Mr. Evans at once announced his results to several persons, and was loth to yield up the honour of being the original discover to Mr. Laming, who, on his part, was vexed at the finding-out of his secret. In September, 1849, Mr. Laming wrote a letter to the directors, informing them of the success of his system of purifying gas and renovating the material; and in January, 1850, Mr. Evans sent in an official report on the subject. His report-book was produced in court, and the report read. The first part is as follows:—

Gas-Works, Horseferry Road, Jan. 26, 1850.

Gentlemen,—I beg most respectfully to make the following report on Mr. Laming's mode of purifying coal gas, as practised here as an experiment for some time past.

The material used consists of muriate of iron decomposed by lime, which forms muriate of lime and oxide of iron. This is mixed with water, and absorbed into sawdust, and put into the ordinary dry-lime purifier. The sulphur in the gas immediately combines with the oxide of iron, forming sulphuret of iron; the ammonia is at the same time taken out by means of the muriate of lime; the carbonate of ammonia in the gas effecting a double decomposition, part of the carbonic acid combining with the lime, and the muriatic acid with the ammonia.

The experiment was tried on the small scale, with the experimental purifiers, and was commenced on the 8th of August, 1849. It was found to remove the sulphur and ammonia most completely from the gas; but when the material was saturated, which it soon was, it was taken out, and fresh put in. If this had continued to have been the way of proceeding, it would have been quite a failure, on account of the expense; but it was observed accidentally, that the material had the property of recovering its former purifying power by exposure to the atmosphere; and, on putting it into the purifier a second time, it purified the gas as well as the first time; and, on taking it out a second time, it was equally effective again. I then suggested to Mr. Laming that, instead of taking the material out of the purifier, it would be far more economical to draw air through the material while in the purifier. This was done, and the same material was used six times over again. The first time of drawing air through the material while in the purifier took place on Oct. 22, 1849.

Moreover, it was well known to scientific chemists, and had been specially mentioned by Berzelius years ago, that hydro-sulphuret of iron became converted into oxide of iron by exposure to air.

The London Gas Company contend that this evidence alone must upset the validity of the plaintiff's claim, and they allege moreover that Mr. Hills did not discover the combined process of using and revivifying oxide of iron at all, but learnt it at the Westminster Gas-Works, where it was being practised; that he did not know of it, or at any rate had no intention of patenting it, when he took out his patent of November, 1849; but that, prior to his specification in May, 1850, he learnt it, directly or indirectly, at the above-mentioned works, and determined surreptitiously to smuggle it into a patent never intended to embrace it. Mr. Hills, on the other hand, says that the above evidence of Laming and Evans may be all very true, but he knew nothing about it; that there was no publication to the world, and certainly no publication to him; that he had completed his own discovery of the process of revivification in 1848, though he continued experimenting in 1849 to ascertain the best mode of using it; that when he took out his patent of 1849 he fully intended to include this invention in it; and that when he specified in May, 1850, he did so include it, having learnt the process solely from his own experiments. He urges also that the knowledge of Laming and Evans must have been very imperfect, because when they tried their process on a large scale it proved a failure.

Now we find each of these positions supported by a certain amount of direct and of corroborative evidence. In the first place, Mr. Hills swears that his account of his discovery, as above described, is true; that he is certain as to the date, 1848, because that was the year in which dry-lime purifiers were first erected at the Deptford Gas-Works, where he tried his experiments; that although he might have visited the Westminster Gas-Works once, perhaps twice, while Laming's experiments were going on, and though he might have made some inquiry about them, he did not know that any oxide of iron, but simply that chloride of calcium, was being used; that he was certainly not told anything about oxide of iron or revivification by Evans; and that he did not hear of it from his brother, who was frequently at the Westminster works attending there for him to some experiments of his that were co-temporaneous with those of Laming.

Mr. Thomas Hills swears that in 1848 the plaintiff was experimenting on gas purification by means of oxide of iron; that he heard of the process of renovation in the latter part of 1848, or beginning of 1849; that he was attending to some experiments of the plaintiff's at the Westminster Gas-Works in the summer of 1849; that he saw Mr. Laming there, and heard from Mr. Evans that they were using Laming's patent; but that he did not see any oxide of iron, did not know that oxide of iron was being used; and certainly did not tell his brother, the plaintiff, anything about oxide of iron.

Mr. Barnard, the manager of the Deptford Gas-Works, swears that Mr. Hills experimented upon their works in the middle of 1848 with a chocolate-coloured material; and that

afterwards a pipe, furnishing crude gas from their works, was carried into Mr Hills' premises through a hole in the wall.

The Rev. Mr. Dale swears that in 1848 he assisted Mr. Hills in his experiments on gas purification by means of oxide of iron; that their difficulty was to obtain a substance which would purify over and over again; that one day Mr. Hills showed him the difficulty overcome; and that though he does not remember the date of this discovery, it was before the hole was made in the wall adjoining the Deptford Gas-Works, through which the supply of impure gas was obtained.

The London Gas Company say that if Mr. Hills really had made the discovery in 1848, it was strange that he did not include it, or rather leave room for it, in his gas patent of 1848, which was not specified until April, 1849; seeing that, according to his own showing, he did not hesitate upon other occasions to patent the crudest notions of his brain, upon which he had not made any experiments whatever, and to construct his titles and deposit-papers so as to cover speculative inventions which it was subsequently found inconvenient to specify. They allege also that the title of his patent specified in April, 1849—namely, "For improvements in treating certain salts and gases or vapours, and for increasing the illuminating power of gas," would cover this disputed invention quite as well as the title of his patent specified in May, 1850—namely, "For an improved mode of compressing peat for making fuel or gas, and of manufacturing gas, and of obtaining certain substances applicable to purifying the same." They say also that the interval between Mr. Hills' alleged completion of his discovery and the taking out of his patent is suspiciously long for a man eager to patent anything; and that the invention as described in the specification of May, 1850, is clearly not the invention for which the patent was obtained in November, 1849. For, the patent being opposed, Mr. Hills had to lodge a deposit-paper with the Attorney-General, describing the nature of his invention. In this deposit-paper the fifth claim is—"For absorbing sulphuretted hydrogen and other gases into porous bodies, and renovating them again by heat, &c., or taking off atmospheric pressure;" but in the specification this claim is developed into—"Thirdly, the purifying coal gas from sulphuretted hydrogen, &c., by passing it through the precipitated or hydrated oxides of iron;" and—"Fourthly, repeatedly renovating or re-oxidizing the said purifying materials by the action of the air, whenever they, from time to time, cease to absorb the sulphuretted hydrogen, so that they may be used over and over again to purify the gas"—these two being the only claims in the specification to which the claim in the deposit-paper refers. It was shown in evidence that the experiments which Mr. Hills obtained leave to try, and which he tried at the Westminster Gas-Works in the summer of 1849, were made with sawdust, and that his attention had been otherwise much directed to the absorption of gases in porous bodies, such as sawdust and breeze, which would give out their absorbed gases on the removal of the atmospheric pressure. It was shown also that oxide of iron did not act by virtue of its porosity, but by chemical affinity; that the gases absorbed by it no longer existed as such, and could not be liberated by taking off atmospheric pressure, or by any other means; that neither could the material be renovated by the mere taking off of atmospheric pressure, but only by the chemical action of the air, brought about equally well by simple exposure or by forcing air through from increased pressure, or by drawing air through from decreased pressure.

In reply to the statement of Mr. Hills that the deposit-paper was written very hurriedly at the Attorney-General's office, the London Gas Company refer to the great experience of Mr. Hills in patent practice, and to the precise and well-defined manner in which the deposit-paper sets forth his several other claims. We observe that this difference between the description in the deposit-paper and in the specification, was commented on very strongly by Baron Bramwell, upon whose mind it seemed to make a great impression. In the next place the London Gas Company say it was scarcely possible that Mr. Hills, and quite impossible that his brother, Mr. Thomas Hills, should not have known what was going on at the Westminster Gas-Works in the autumn of 1849. Evidence was given by numerous witnesses that Mr. Thomas Hills was frequently at the works for days together; that the operation he was conducting did not require his constant attention; that the purifiers with which Mr. Laming was experimenting were close to and within sight of the scrubber with which the Messrs. Hills were experimenting; that the same workmen who assisted Laming assisted Hills; that Evans's discovery created considerable sensation among the work-people, strangers, officers, and directors, some of whom were brought down specially to witness it; that Mr. L. Thompson was sent by the son of the deputy-governor to examine the subject, and that the place was strewed all over and trodden about with black and red stuff, such as had never before been seen in gas-works. It certainly does seem most remarkable that Mr. Thomas Hills, who, on the plaintiff's theory, was previously acquainted with his brother's discovery of the use and renovation of oxide of iron, should not have noticed what was taking place around him. Moreover, it was admitted that Mr. Hills himself was at the works upon one, if not upon two occasions while Mr. Laming's experiments were in operation; but he also saw nothing to attract his attention.

In addition to this, however, Mr. Evans swears that he told both Mr. Hills, the plaintiff, and his brother, Mr. Thomas Hills, of this process of renovation. His statement is rendered probable by the circumstance that he, being full of his discovery, seems to have told everybody; and it is confirmed by the evidence of Mr. Lewis Thompson, who swears that about Christmas, 1849, he heard from Evans that he had told Mr. Hills, and called him a great fool for not keeping his invention secret, as Mr. Hills would be not unlikely to include it in some unspecified patent. But this statement of Evans was distinctly denied by both of the Messrs. Hills, and its force was certainly diminished by a reference to what took place at an arbitration in 1851, upon which occasion Mr. Wonfor, a former assistant of Mr. Hills, swears that Mr. Evans said he had told one of the Messrs. Hills, but could not say which. Mr. Evans, on the contrary, expressed his strong conviction that he never did say, nor could have said, anything of the sort; but, after a threatening allusion to the production of some short-hand writer's notes—which, however, do not appear to have any existence—he declined to swear positively that he never had said so. Mr. Evans also said that he remembered telling Mr. Hills, from the circumstance of there being a heavy thunder-storm at the time; but he could not give any date for the thunder-storm, save that it was after the discovery had been made. Mr. Hills gave evidence that a thunder-storm did occur on the 27th of July, before the date of Laming's experiments, and stated that he was at the gas-works on that day, and had not been there on the occasion of any other thunder-storm. The judge pointed out how these discrepancies in relation to Mr. Evans's evidence might have arisen accidentally; but that if they weakened his testimony with regard to one of the Mr. Hills, they rather strengthened it with regard to the other. In answer to the statement of Mr. Hills, that Messrs. Laming and Evans failed when they attempted to apply their process on a large scale, and that, therefore, their knowledge was very imperfect, it was maintained by the London Gas Company that the failure in question, which was only partial, arose from the accidental and speedily-recognized circumstance of the experiment being made during an unusually cold winter, whereby the chloride of calcium was caused to crystallize around the oxide of iron, and so prevent the access of air to it; that partial failure not unfrequently attended the first use of most excellent inventions; and that difficulties occurred in the first use of Mr. Hills' own patent, which were only overcome by his repeated intervention, by his energetic determination to succeed, and by the patient assistance he derived from the London gas managers.

In the foregoing epitome of the evidence given on this important trial we have abstained from offering any opinion of our own, preferring rather to leave the question to the judgment of our readers, most of whom are at least as competent to appreciate its merits as the jurymen who have pronounced their verdict thereon. The whole matter will be reviewed by the Court of Exchequer sitting at Westminster in the course of next term, when we may again return to the subject.

The evidence given by Mr. William Crosley before the Parliamentary Committee on the Supply of Gas in the Metropolis, in which it was asserted that many of the Manchester gas-meters were found by him to have been overcharged with water, has excited considerable sensation in that city, more especially as it has transpired that the salary of one, at least, of the chief officers of the gas committee was dependent upon the quantity of gas sold. The subject was brought before the council at its last meeting, and in the report made by the gas committee

it is admitted that the possibility of overfilling the meters in general use is well known to all who are acquainted with the principles of their construction, while the only check suggested against the abuse of this liability to error is the taking of "especial care that the officers selected to inspect the meters were proper and intelligent persons," and that such officers be "supplied with printed instructions, in order to secure due care and exactness." Whether it is wise to entrust underlings with any discretionary power in such a matter is more than doubtful, and we apprehend the most prudent course would have been to discard the use of high-spouted meters for the future, and to have cut down the spouts of those now in use to the correct water-line as opportunities presented themselves. This might have necessitated a more frequent inspection of the meters in order to adjust the water in them, but the bare suspicion that, either by ignorance on the part of the consumer himself, or by collusion between the officials, more gas may be charged for than is actually consumed, is too serious an imputation to allow the present system to be continued; and Mr. Alderman Shuttleworth has laid himself open to unfavourable criticism by asserting that this was a condition which there was no possibility of avoiding, and that science and ingenuity has hitherto failed in pointing out a remedy.

Mr. Clegg requests us to state that he has succeeded in combining a governor or pressure-regulator with his new patent hydraulic gas-meter, described in the JOURNAL of June 8th last, which is now in operation; and we perceive in the Paris papers a notice to the effect that after submitting the self-adjusting and compensating gas-meter of Messrs. Crosley and Goldsmith to the most severe tests, and having ascertained that it registers the exact quantity of gas consumed, without absorbing more than the ordinary pressure required to set such instruments in motion, the Prefect of Police of the Seine has authorized its being used within his jurisdiction.

Register of New Patents.

24.—JOSHUA KIDD, of 6, Bridge Parade, Bristol, in the co. of Somerset, C.E., for "*Improved apparatus for regulating the pressure and supply of steam, gas, or other rarefied or compressed bodies, and for causing more perfect combustion of the gases procured from coal, and increasing the heating and illuminating power of the said gases.*" Feb. 7, 1858. Provisional protection only obtained.

This improvement consists in the application of a valve with disc or pressure-surfaces made to move through a socket in a box or case, and balanced on the pressure, for regulating the pressure and supply of steam, gas, or other rarefied or compressed bodies; at the bottom of which box is placed a quantity of spirits of turpentine, coal naphtha, or other volatile bodies, over which the coal gas is made to pass, and the effluvium from which volatile bodies combines with the gas, increases its heat and illuminating power, and causes its more perfect combustion.

The claim is for the application of a valve with a disc or pressure-surface for such purposes, and its combination with a reservoir or receptacle containing volatile spirits for increasing the brilliancy of coal gas, and for impregnating air with vapours emitted from such spirits.

421.—WILLIAM SCOBLE, foreman of gas-works, Bow Common Lane, Mile End, for "*Arranging the retorts, furnaces, flues, communications, and connexions for the more economical manufacture of gas, and by which arrangement the generative heat may be obtained from either coal, coke, tar, or other similar combustible substances.*" March 3, 1858. Provisional protection only obtained.

The drawing attached to this specification shows a pair of upper and lower through-benches of retorts, as in a large establishment; and the peculiarity of the invention consists, first, in removing the underneath furnaces entirely (leaving room for the introduction of more retorts), placing the furnace on the top of the benches, and conducting the draft downwards to the underneath flues which communicate with the main shaft. The benches may be built single or double and in continuous lengths, as may be required. They are run up with piers, arches, turned faces built, forming hot-air furnaces, chambers, or cellars, through which the heat may circulate in any way that may be needed, by placing flues in such places as may be found advantageous.

The claim is for the method of placing the furnaces above the retorts, drawing the heat downwards, and accumulating and retaining the same in different retort-chambers, by which arrangement any combustible substance may be used to obtain the primitive heat. The advantages derived by this method are the more equitable distribution of the heat, whereby the cracking of the retorts is prevented, gas of a superior quality is generated, and an equivalent of coke tar, &c., is obtained, with a considerably less consumption of fuel than by the ordinary processes.

433.—SAMUEL BOULTON, of 11, Luther Street, Everton, Liverpool, in the co. of Lancaster, agent, for "*Obtaining by an improved method certain products from materials used in the manufacture or purification of gas.*" March 4, 1858. Provisional protection only obtained.

This invention consists in obtaining chemical products from any materials containing oxide of iron, which shall have been used in the purification of gas of the kind commonly employed for illuminating purposes. The products which are thus obtained are ammonia, prussiate of potash, prussiate of soda, prussiate of iron (commonly called "prussian blue"), sulphur, and sulphuric acid. Instead of placing the material in retorts or pots, and fusing the same along with potash, or carbonate of potash, or sulphate of potash and lime, as has been attempted for the purpose of obtaining prussiate of potash, the mode here adopted is as follows:—If the material to be operated upon is mixed with wood or sawdust, the whole is placed in water for the purpose of washing out the same. The patentee prefers then to grind the material, but this is not absolutely requisite. It is then placed (either in a ground state or otherwise) in a solution of carbonate of soda, or carbonate of potash, sulphate of soda, or sulphate of potash with a little lime added thereto, if found desirable; but it is preferable to render the soda or potash used in the solution either wholly or partially caustic. Heat is then usually applied, and frequently agitation; but these are not considered absolutely essential. The ammonia evolved during this operation may be caught, and condensed by any of the ordinary methods, and for any desired purpose. When the whole has been sufficiently operated upon, the solution is run off and allowed to subside. Sometimes it is found requisite to add acid (muriatic acid being preferred) to throw down any sulphur which may be in the solution, and, if requisite, the same is filtered. The residuum, after being washed, is laid aside to be operated upon in manner hereinafter described. The clear solution obtained as above mentioned is either crystallized for the production of prussiate of potash or prussiate of soda (according as either soda or potash may have been used), or else a solution of iron (muriate of iron being preferred) is added thereto for the production of prussiate of iron, which latter may be either disposed of as such or treated in the ordinary known method for the production of prussiate of soda or prussiate of potash.

The residuum above mentioned after being washed, as already stated, is dried, and placed in any convenient apparatus for the purpose of obtaining the sulphur therefrom by sublimation, or is applied in the manufacture of sulphuric acid.

In addition to the method above detailed, the following course is sometimes pursued. To the original materials (ground or otherwise) either muriatic or sulphuric acid is applied, diluted with water if found desirable. By these means the ammonia is obtained in solution, which may be washed off and treated as may be desired. This operation is facilitated by the application of heat. The remaining mass, after being washed with water, is placed in the alkaline solution before mentioned, and operated upon in the manner already described.

472.—WILLIAM CLARK, of 53, Chancery Lane, in the co. of Middlesex, engineer and patent agent, for "*Improvements in gas-meters.*" Patent dated March 8, 1858.

The object of the present specification is to indicate several arrangements whereby the hydrostatic tube may be employed in gas-meters. It has often been attempted to employ the hydrostatic tube in gas-meters for maintaining the level of the water constant; but it has always presented such inconveniences in its application as to necessitate its being abandoned. These inconveniences have been studied with great care and observation, and the arrangements hereinafter described have been discovered, which arrangements are intended to obviate the defects alluded to.

The first of the inconveniences mentioned consists of the difficulty, or, it may be, the impossibility of maintaining the closing of the upper reservoir in a state completely hermetical, which prevents the possibility of guarding against the flooding of the meter. Moreover, supposing the closing to be quite hermetical, if it were opened merely for curiosity or otherwise, it would be sufficient to cause the water of the reservoir to descend into the meter.

In the next place, the hydrostatic tube has always been put in communication with the front chamber of the meter, in which it causes, as is well known, a lowering of the level of the water when the meter acts. This lowering is not always the same, but increases in proportion as the quantity of gas supplied increases; while for a uniform supply it becomes impossible to regulate the level exactly, if the parts in motion become foul.

In the arrangement above alluded to the renewing of the water is effected during the passage and combustion of the gas, which results in this further inconvenience—the level of the water becomes sensibly lowered in the anterior chamber of the meter below the orifice, before the breaking of the nemiscus or bubble which conducts the lower water to the tube, by reason of its capillary action, the level being obtained by a descent; thus the water will not cease to supply the tube. After some time, when this capillary action is overcome, there will be a considerable void to fill up, which produces a succession of bubbles, agitating the gas, and communicating to the flame at the burners a disagreeable and very objectionable motion. Moreover, at the time of putting this meter in motion, when the gas should overcome the inertiæ of the movable parts of the meter (the wheel and train), it produces an extraordinary lowering of the level of the water, the hydrostatic tube becomes immersed, and a volume of water enters the meter and alters the level, which it is desirable to render as constant as possible.

Another inconvenience resulting from the arrangement hitherto adopted consists in the separation of the overflow-tube and of the hydrostatic tube, a separation which renders the regulation excessively difficult.

[The drawings attached to the specification show how the particular difficulties before mentioned, and others which present themselves, are overcome.]

The upper reservoir is filled by means of a syphon, the upper orifice of which may be furnished with a small funnel, the opening being closed by a screw-plug. In proportion as water is poured in the funnel it passes into the reservoir, and the gas contained in this reservoir will escape by a tube entering into the box or compartment, care being taken to remove the plug when the reservoir is filled with water. The water follows the same course as the gas, and passes out by the lower orifice of the tube. When this takes place the supply of water is stopped and the plug replaced.

During the filling it is necessary to close the stop-cock on the inlet-passage of the gas and that of the escape, as in this operation the pressure will be slightly augmented, which produces a little elevation in the level, but which can be rectified by opening the overflow-passage (as in ordinary gas-meters) every time that water is poured into the meter. Although it is better usually to keep the plugs in position, they may at all times be removed without inconvenience, the tubes forming of themselves a

hydraulic closure by the known action of syphons. This mode of supply prevents the meter being filled with too much water.

Although the hydrostatic tube is placed in the front chamber, it is put in communication with the hinder compartment by means of an opening, and separated from the front case by means of a small square partition, the lower part of which dips in the water. The effect of this disposition and arrangement is this: during the action, and at the same moment as the agitation takes place which lowers the level of the water in the front compartment, the level rises round the tube, and covers the orifice without causing any inconvenience. If at the moment when the light is extinguished there has been any dissipation of the water, and, as a consequence, a slight lowering of the level, it is immediately re-established without inconvenience.

At all times the effect of the capillary attraction maintained, causes a slight difference in the level, but it may be remedied by placing the hydrostating tube in another tube of a rather larger diameter, closed at the bottom, and communicating with the water of the front compartment by a small hole. When the nemiscus breaks, a single bubble of gas escaping will bring into the tube a sufficient volume of water to cover the orifice, when the level is gently re-established by means of the flow through the small hole, and the nemiscus due to the capillary action is again formed at the orifice of the tube. From that time the water is maintained at a constant level while working, either with a large or small supply, and when the supply is cut off, the level of the water re-establishes itself with mathematical precision.

Lastly, in order to render regulation easy, the overflow-pipe, the isolating tube, and the hydrostatic tube (or rather the lower part of this tube) are invariably joined together; so that when experience has determined the relation between the height required by the capillary action and the height of the overflow and the orifice, the parts are united in their proper relative positions, and the regulation of the meter may thus be effected in the ordinary manner by altering the level of the overflow. The overflow has been described as being united to the lower part of the hydrostatic tube, for which purpose this tube is composed of two distinct parts, the upper part of which is fixed, and the lower part, having an orifice, slides loosely on the upper part, which also serves as a guide. This arrangement is of great importance, inasmuch as it destroys the resistance that the hydrostatic tube would present to the free action of the overflow when regulating it, and which arrangement also allows of the hydrostatic tube being in a vertical position. The form given to the orifice is peculiarly favourable to the quiet exit of the bubbles.

The claim is for—

1. The mode of introducing the water, and the exit of gas in the upper reservoir as described.

2. The communication of the hydrostatic tube with the back compartment of the meter.

3. The isolating tube, with which the lower part of the hydrostatic tube is enclosed.

4. The connexion between the hydrostatic tube and the overflow, with a view of rendering easy the regulation of the meter.

5. The dividing the hydrostatic tube into two parts, one sliding on the other, which arrangement has the advantage of facilitating the regulation by keeping the tube in a vertical position.

442.—Nicholas Common, of Rose Hill, Brighton, in the co. of Sussex, engineer, for "*An improved arrangement of water-supply valve.*" March 5, 1858. Provisional protection only obtained.

The chief object of this invention is to prevent the waste of water which at present occurs in water-closets. For this purpose an equilibrium-valve is provided in the outlet-pipe, which commands a two-way-outlet-passage for the water; and this valve is actuated by means of a rock-bar mounted on a fixed fulcrum, and connected at one end with the valve-rod, and at the other with a link jointed to the fixed bearing. On the fulcrum of this rock-bar a tumbling-lever is loosely mounted, which by its action in either direction opens and closes the equilibrium-valve by falling over into one or other end of the rock-bar. Below the valve is a plunger, which fits into the closed bottom of the outlet-pipe, and is pierced with a small hole to allow water to flow beneath the plunger and escape upwards therefrom, thus serving as a cushion for the downward motion of the plunger. The handle for working the valve is connected with the pan-lever as usual, and to the lower end of the handle-rod-radius, levers are connected, their fixed fulcrum being the fulcrum of the rock-bar. Attached to the tumbling-lever by a swivel-pin is a tumbling-piece, against which the levers as they rise bear, and thereby the radius-levers alternately (as the handle is drawn up) throw over the tumbling-lever which forces the valve in contact with its upper or lower side. By this arrangement it will be understood that water can only escape at the moment that the valve is being moved from one side to the other.

PROVISIONAL PROTECTION

HAS BEEN GRANTED FOR THE UNDERMENTIONED INVENTIONS.

1895.—Louis Felix Henri Droinet, of Paris, for "*Improvements in bearings and packings for rotating and reciprocating shafts and joints of pipes, and other like purposes.*" Aug. 20, 1858.

1907.—Richard Laming, of Hayward's Heath, Sussex, for "*Improvements in purifying gases and liquids, in preparing purifying liquids, and in apparatus for apportioning or measuring liquids.*"

1909.—Francis Puls, of Roxburgh Terrace, Haverstock Hill, Middlesex, chemist, for "*Improvements in the distillation of coals.*" Aug. 23, 1858.

1910.—Francis Puls, of Roxburgh Terrace, Haverstock Hill, Middlesex, for "*Improvements in the distillation of bituminous matters and gas tar.*" Aug. 23, 1858.

1935.—Samuel Newman Rodier, of 21, Oak Village, St. Pancras, London, for "*Improvements in apparatus for regulating gas.*" Aug. 26, 1858.

1943.—Herbert William Hart, of 69, Fleet Street, gas engineer, for "*Improvenments in the application of gas to chandeliers.*" August 27, 1858.

1944.—Frederick John Evans, of the Chartered Gas-Works, Horseferry Road, Westminster, engineer, for "*An improvement applicable to gas purifying.*" Aug. 27, 1858.

NOTICES HAVE BEEN GIVEN OF INTENTION TO PROCEED WITH THE UNDERMENTIONED INVENTIONS.

892.—John Birch Paddon, of Gray's Inn Road, in the co. of Middlesex, engineer, for "*An improvement in gas regulators.*" April 22, 1858.

973.—Andrew Smith, of Mauchline, in the co. of Ayr, N.B., for "*Improvements in valves.*" April 30, 1858.

1248.—Thomas Scholefield, of Paris, gas-meter manufacturer, for "*Improvements in gas-meters.*" June 3, 1858.

1724.—Henry Bessemer, 4, Queen-Street Place, New Cannon Street, London, for "*Improvements in the treatment of pit coal, and in the separation of foreign matters therefrom.*" July 30, 1858.

Legal Intelligence.

IN THE ARBITRATION OF THE GREAT CENTRAL GAS CONSUMERS' COMPANY AND MR. ALEXANDER ANGUS CROLL.

(*Continued from page 507.*)

Sixteenth Day—*continued.*

Robert Marsden Massey, Esq., examined by Mr. Lloyd.

I am secretary to the Great Central Gas Company, and have been so since July, 1850. I have regularly attended the board-meetings of the company as secretary since that time, and it is part of my duty to record the transactions of the board. The course adopted as to taking the minutes is this: The notes that are taken in the previous week, in the following week are read at the board for confirmation, and then they are entered in the fair minute-book of the company; the fair minute is then produced to the chairman at the following meeting for his perusal and signature. All the minutes are prepared under my superintendence and direction, and I have not the slightest doubt that they are correct. All documents handed in, in the way of reports or statements, are entered on the minutes when thought material. Mr. Croll has been in the habit of attending meetings of the board. I never heard him bring before the board any claim in respect of services alleged to have been rendered by him in the formation of the company, neither has that point been discussed at the board in my presence. The reports prepared for the shareholders were generally read to the board before they were submitted to the meeting. I cannot say that Mr. Croll was present on all occasions when these reports were read; but whenever he was present his name was recorded in the minute-book. I remember reporting to the board on the 1st of July, 1852, from Mr. Croll, that he saw no objection to the company signing the contract with the Commissioners of Sewers, as prepared by Mr. Tyrrell, and agreed to by Messrs. Davidson and Bradbury on behalf of the company. The circumstances were these: The draft was sent by Mr. Tyrrell to Mr. Davidson; he forwarded it to the office, and I gave it to Mr. Croll. There was a great delay in sending it back. Mr. Tyrrell wrote five or six times to Mr. Davidson, and Mr. Davidson wrote five or six times to me, urging a compliance, and stating that the commissioners were dissatisfied with the delay. These circumstances I remember, because we are not in the habit of having correspondence with Mr. Tyrrell; and those copies of letters I have referred to, and they bear me out. During that time Mr. Croll had the draft for approval; and when he returned it to me at the meeting of the board on the 1st of July, 1853, I said, "Do you see any objection to the board signing it?" and he said, "No, I do not." He had the draft for more than a week. I never gave instructions to Mr. Schomberg to tilt a meter at the King's Head Tavern, on Ludgate Hill; neither did I ever give him to understand, by word or gesture, that he was to permit a meter to be tilted or tampered with; neither have I, directly or indirectly, given any instructions or permission to any officer of the company to favour the consumer by allowing gas to be used without being brought into charge. The thing is out of my department. [The letter of the 29th of April, 1852, was handed to the witness.] The first page is in my handwriting. I do not know how it comes to be in my handwriting. My impression is that it was dictated to me by Mr. Croll himself, or Mr. Pearson. I will not swear it; but my impression is that Mr. Croll dictated it to me, standing by my left hand side at the desk, which he was in the habit of doing. The 29th of April, 1852, is the correct date, and the dictation took place just before the board-meeting, and the letter was handed in and read to the board that day. I have not had the custody of that letter since that time; for immediately after it was read it got out of my possession, and for many years I have been very uneasy about it. I wished to know where it was, and I have repeatedly asked Mr. Davidson about it, and I told him that he must have it. He said he had not got it; and I said, "Yes you have, and we must look among your papers." And Mr. Davidson will recollect within the last few months we have turned it up out of his boxes, and I have not had it since.

The Umpire: When this was produced at the board, there was a minute made of its having been produced, and a copy was entered in one of the books on the 29th of April. The rough minutes never contain the documents. I have never read it over, but as far as I am aware there is not the slightest variation between this and that.

By Mr. Lloyd: The date was put on it when it was written.

The Umpire: For the entry in the minute; there is no date to it at all.

Mr. Archibald: I understand that is so.

The Umpire: But the letter itself says 29th of April.

Witness: It is my own writing as far as there [pointing]; and, being my own document, and not having time to do it I set one of the clerks to copy it.

The Umpire: Has any gentleman looked over it to see that it is correct?

Mr. *Rait:* There are corrections in that document which do not bear the initials of the parties signing it, but in substance it is copied there.

Mr. Croll: With these erasures?

Mr. Lloyd: The minute, of course, takes it as altered by the erasures?

Mr. *Rait:* Oh, yes.

By Mr. Lloyd: I cannot tell at this time how it happens that there is no date to the letter in the minute-book; if I had copied it myself I should; but I started one of the clerks, as I thought, fair, and I expected he would have gone on with it. I am quite sure that the date of the 29th of April, 1852, was put on by me at the time I wrote that first sheet.

By Mr. May: This date was on the paper when it was read to the board that afternoon; Mr. Pearson, I believe, handed it in, Mr. Croll being present. This is the contract that has been acted on since, but there does not appear to be any resolution upon it. Had there been, it would have been recorded. [The witness's attention was directed to the minute of the board of the 27th.]

The Umpire: We have not had returns put in since the 29th of April, 1852, in which Mr. Croll has been paid.

Mr. Lloyd: Mr. Croll has been paid 1s. 9d.; and, moreover, I shall put in presently other documents—the report of Mr. Croll, confirming this:—

A letter from Mr. Croll, embracing the offer made by him on the 23rd inst., to supply the company with gas, was read by Mr. Pearson.

That letter was taken away from the board by Mr. Pearson. My impression is that the letter of the 29th is a substitution for the one that was put in on the 27th.

Mr. ARCHIBALD: You have this letter on the minutes?

Mr. LLOYD: Surely I have a right to ask this question?

The UMPIRE: If it is upon the minutes, the minutes ought to be read.

Mr. ARCHIBALD: There is a minute of the 29th of April:—

Mr. Pearson handed in the letter and offer of Mr. Croll, produced at the meeting of the board on the 27th, and now signed by Mr. Croll.

So that it is obvious it is the same letter.

Mr. LLOYD: But it is taken back to have some alterations made in it, and it is brought back altered. It is quite obvious on the face of it, and thereupon it is so formally signed as the ultimate proposal. It is entered on the minutes.

Mr. ARCHIBALD: This is a question of construction of the minutes; and the minute of the 29th of April is this.

Mr. LLOYD: You speak of that as a written document. It is merely a memorandum of what took place; and it is as competent to me to ask the witness who makes the minute what took place as it is to put in the minute itself.

The UMPIRE: Why should you prevent Mr. Archibald calling attention to your own minutes?

Mr. LLOYD: He is trying to exclude me from asking the question, because he says there is a record.

Mr. ARCHIBALD: I say, on the 27th you had accepted this very letter. It would appear so by comparison with these minutes, and then it becomes a written contract, and you are not at liberty to have evidence of it. On the 29th of April, 1852, you find this:—

Mr. Pearson handed in the letter and offer of Mr. Croll, produced at the meeting of the board on the 27th;

and on the 27th you find a letter produced to the board, that was then adopted, subject to certain conditions, and those conditions waiving some portion of what was required in the letter itself.

The UMPIRE: As far as I am informed, no letter of the 29th has been put in by the company.

Mr. ARCHIBALD: That is so.

The UMPIRE: Then you say—"Mr. Pearson handed in the letter and offer of Mr. Croll, produced at the meeting of the board on the 27th, now signed by Mr. Croll."

Mr. ARCHIBALD: It was adopted on the 27th.

Mr. LLOYD: Do not anticipate the argument.

The UMPIRE: The question is, Does this entry in their book operate by way of estopper to his inquiry?

Mr. ARCHIBALD: I think so; not that I have any doubt about the fact.

Mr. LLOYD: The evidence is, that the letter that was handed in on the 27th by Mr. Pearson was taken away by Mr. Pearson, and the evidence is that Mr. Pearson, on the 29th, produces a letter—that is, this letter.

Mr. BARLOW: And which the minute states is the letter.

Mr. ARCHIBALD: And which Mr. Pearson says is the letter.

Mr. LLOYD: I have got to examine Mr. Pearson upon that. Do not let us argue the thing, or the effect of it. We are on a question of the admissibility. Supposing there be an ambiguity in this, what does that mean? Does it mean a letter identical, words and figures, with the letter handed in on the 27th? or is it not consistent with the fact that that letter, having been taken away by Mr. Pearson on the 27th, and the first part having been rewritten by the direction of him or Mr. Croll, by Mr. Massey, on the 29th, and then handed in, is not in terms the identical letter handed in by Mr. Pearson on the 27th, but as substantially a proposal to the same effect and the same terms, with certain alterations in it? Then, if that is so, the last act of Mr. Croll, signed by him that day, handed in by his agent, Mr. Pearson, to the board that day, I say it is the last proposal; and therefore it is competent to me to examine this witness as to those facts, for the purpose of raising that point, that as to the minute being in the way it is, it is a mere memorandum made by the witness himself, and nothing else; it is a record made at the time according to his impression. Then the witness can explain whether the letter of the 27th means the identical letter in words and figures, which it could not be, or whether it is the letter having been taken away in the mean time, and then presented in an altered shape.

Mr. ARCHIBALD: My contention is that this is more than a memorandum; it would be very well if it were a memorandum, but these minutes taken together are an acceptance of the contract.

Mr. LLOYD: It speaks of a minute of the 29th, which speaks of the minute of the 27th.

Mr. ARCHIBALD: We must take the minute of the 29th, and the minute of the 27th together, and when we find that the minute of the 29th refers to the letter of the 27th, we are sent back to the minute of the 27th; and then we find an acceptance of the letter put in at that time, and my friend is not at liberty to go into it.

Mr. LLOYD: I do not seek to vary the contract. Show me the minute of the 27th which is an acceptance of the contract, and I should be the last person to vary it.

Mr. ARCHIBALD: I will show you the letter of the 27th; it is a letter that here bears date the 29th.

The UMPIRE: Do you agree that that letter that you hold in your hand is the letter, if the date was altered to the 27th?

Mr. ARCHIBALD: Yes; I say this is the letter that was unsigned, but accepted subject to the signature on the 27th.

The UMPIRE: Then you say that is a truthful letter, as you hold it in your hand, but of the date of the 27th?

Mr. ARCHIBALD: Precisely.

The UMPIRE: Mr. Lloyd says it is the 29th. Will you just tell me, gentlemen, does the date signify?

Mr. LLOYD: Mr. Archibald says the letter given in on the 27th was given with a modification that varied the term in Mr. Croll's favour. He says, for example, in the letter, it is proposed that the extra illuminating power shall not be paid for until a dividend of 10 per cent. has been paid to the shareholders; but, he says, the acceptance is in terms absolute—absolute acceptance where it is done by the direction of the board, and you cannot vary that by any term of the letter itself. The effect of that I am not going to attempt to anticipate; I know it would be utterly valueless. I know a point will be made of it, and if I can clear up the fact I will; and it appears on the evidence of the witness that the letter was a final proposal put in on the 29th superseding any other proposal made, and that has been a letter acted upon from that time to this, and I say that is a contract, and is in terms an acceptance of that proposal.

The UMPIRE: Then the minute, which is under the date of the 27th of April, 1852, is that the clause that is affected?

Mr. LLOYD: That is what my friend will say affected the question.

Mr. ARCHIBALD: I say Mr. Croll makes a proposal and condition, the condition being for the benefit of the company; the company in their acceptance chose to waive that condition, consequently there is no need of any replication on Mr. Croll's part.

The UMPIRE: Without arguing it, do you say that that document, being dated on the 27th, modifies this minute, or that this minute modifies that document?

Mr. ARCHIBALD: I say that the minute modifies the letter.

The UMPIRE: Then it is quite clear he is entitled to go into it.

Mr. ARCHIBALD: How can that be? I say it modifies the letter; it is a written acceptance in terms.

The UMPIRE: He is clearly entitled to go into that, to show that the 29th of April is the proper date of the letter, and not the 27th.

Mr. LLOYD: That is all I go into it for.

The UMPIRE: At the same time, do not suppose that my friends and myself will discuss seriously that point. We will admit the evidence, but on my authority *ex cathedra;* we will discuss it, by-and-bye, whether the evidence has been properly received; and if that evidence has been improperly received, it will have no effect upon us, but if it has been properly received, then we will consider what the effect of it is.

Mr. ARCHIBALD: First, we say it is an acceptance which constitutes a contract, and I say that contract being a contract with the company, my friend is not at liberty to vary it. He calls a witness who has control over the minutes, and may give an account that we are unable to contradict, but which may be inconsistent with the minute; you are to adopt the minute or the verbal statement of the witness. But the point I make is, this amounting to a written contract, and there being no ambiguity in it, my friend is not at liberty to vary it.

The UMPIRE: If there were any date put in this memorandum made by this gentleman, the secretary, a date in the book, it would speak for itself, and would dispose of it all. There is an omission if the original, of which this is a copy, contained a date; he ought to be at liberty to show that this is not the original—that this is a copy; but he says, I will produce to you the original, and show it has a date.

Mr. ARCHIBALD: I have no objection to his asking to that extent; I admit there is a letter that bears date the 29th.

Mr. LLOYD: And written in part on the 29th?

Mr. ARCHIBALD: That is possible.

Mr. LLOYD: And signed on the 29th?

Mr. ARCHIBALD: That may be so; to that I do not object.

The UMPIRE: You are quite at liberty to do this, notwithstanding the alteration of the date, to say that the modification, which we insist is a modification of the contract at the end of the minute, is a modification of the contract.

Mr. LLOYD: He is quite at liberty to contend that, and I do not care one button about it, whether he does or does not; but I want to know this, whether this proposal made on the 27th of April is or is not Mr. Croll's last mind on the matter, after consideration and discussion handed in to the board, and I am going to show the next day embodied in a report to the shareholders, with that very clause in it, Mr. Croll being present, as to the contingency of this 10 per cent.

The UMPIRE: We will receive this evidence, but we will consider hereafter whether it should be admitted, and what effect it has.

Mr. ARCHIBALD: I must be in your hands.

The UMPIRE: That is the decision at law; we will hear it, and if we come to the conclusion that it must not be received, we will reject it peremptorily.

Examination resumed: According to the best of my recollection, I wrote that letter from the dictation of Mr. Croll or Mr. Pearson on the 29th of April, and the date was put upon it at that time. It was read to the board by Mr. Pearson on that day, and entered on the minutes. The next day, the 30th, the general meeting was held, and in the report to the shareholders is this passage:—

In January last Mr. Croll took upon himself, without instructions from us, to increase the illuminating power, so as to place his gas at a standard considerably above that which he was required to supply. We have called in the aid of Professor Graham and Dr. Leeson, and, under their advice, we have raised the standard candle used in measuring the power of the gas from 131·5 to 140 grains sperm, and we have remodelled our contract with Mr. Croll, so as to obtain from him gas of that standard, ranging between 12 and 16 candles. The contract price at present paid to Mr. Croll is 1s. 4½d. for 9½ candles, being at the rate of 1⅞d. per candle; we have now agreed to pay him an extra charge of ¼d. for every additional candle of illuminating power which we may require. To enable us to give the consumers gas of this superior description at a charge of 4s. per 1000 feet, it is necessary that our consumption should be increased to the amount which our former calculations assumed would be the amount required. Mr. Croll's confidence is so strong that this increased demand will be realized, that he has arranged with the board that he is to be paid monthly, as heretofore, for gas up to 9½ candles, and that he is to charge the company for the additional illuminating power which he may give, to be paid for only after the shareholders shall have been paid their stipulated dividend of 10 per cent.

Mr. Croll has never claimed to be paid absolutely the ¼d. per candle beyond the 9½ candles to my knowledge. No account has been delivered by which that claim has been made. Excepting when he has been very much below his standard of 9½, Mr. Croll has never been instructed by the board to raise the illuminating power, that I am aware of.

Cross-examined by Mr. ARCHIBALD: When the report for the shareholders was read on the 29th, I do not know whether Mr. Croll's attention was called to it, or whether he was present when it was read.

By Mr. LLOYD: The report to the shareholders was printed in a pamphlet, and circulated to all the shareholders.

By Mr. ARCHIBALD: I do not know when that report was prepared, who prepared it, or how long it might take to prepare. I could not have written such a report in one day. They were generally prepared by the chairman, the deputy-chairman, Mr. Pearson, and Mr. Croll. I have a very distinct recollection of having written the first sheet of the letter of the 29th of April, because it was brought to me either by Mr. Croll himself or Mr. Pearson; I cannot tell which. My impression is Mr. Croll himself, and I wrote the first page from his dictation, which I had been in the habit of doing repeatedly. I see it is in different handwritings. The letter of the 23rd was taken away, and brought again, with some alteration or substitution. I do not think I saw the letter of the 29th before it was read to the meeting. I do not know what became of the first sheet of the letter of the 23rd; I never had it. Although the minute-book does not say that the letter was read on the 29th, I have no doubt that it was read. If it had been read half a dozen times before, it would be read again. Mr. Pearson was an honorary director in 1852. He still has the privilege of coming to the board, but he never does. I made an entry in the minute-book of every arrangement made by the board. [A minute in the reference to Mr. Croll, of the 27th of November, 1854, was handed to the witness, who said it was his handwriting. It was a document signed by Mr. Massey and Messrs. Robson, Levy, and Franklyn, on the 27th of November, 1854, and is as follows:—

Messrs. Robson, Levy, and Franklyn having disputed the charge made upon them by this company, for gas burnt between November 18, 1850, and the 23rd September, 1854, amounting to £277. 18s. 1d., of which they have paid £151. 15s. 4d., leaving a balance now due of £126. 2s. 9d.; Messrs. Robson, Levy, and Franklyn, and the Great Central, having mutually agreed that the whole matter should be left for settlement to a gas engineer, to be appointed by Mr. Mann, the engineer of the City of London Gas Company, and Mr. Croll, engineer of the Great Central, and these gentlemen having met on the 22nd inst., nominated Mr. Laing, of the Independent Gas Company as umpire. It is hereby agreed by the undersigned, that they will be satisfied with, and will abide by the decision of Mr. Laing, and that his award shall be final and conclusive, and binding on both parties. We also further agree to pay Mr. Laing our respective shares of any expenses he may award for this reference. It is also further agreed, that each party may make public the proceedings of the case. (Signed) R. Levy and Co.; R. M. Massey, for the Great Central.]

Witness: We have not opened an illuminating account in the books.

Mr. DAKIN: I am afraid I have led you into that error; I know the value of that illuminating power had been taken by Dr. Leeson; I think I led you into a mistake.

The UMPIRE: You have.

Mr. DAKIN: We have the means of making the account, but the account itself is not made.

Mr. ARCHIBALD: This is a minute of the 10th of November, 1854:

Resolved—That Messrs. Levy, Franklyn, and Co., be informed that the company have no objection to leave the statement of this account to an independent gas engineer, to be appointed by the company's engineer and the engineer of the City Company, on their behalf, and by this company's engineer; that is, as to the account in dispute between them.

Witness: By the company's engineer, I mean Mr. Croll. These matters in dispute were not thought to be engineering points; they were excess cases, and in that particular case the gas was complained of as being bad; it was sent through with greater force they said than it ought to have been, and they said they paid more to us than to the City Company, and we could not get the money from them without taking proceedings. Upon that the board instructed Mr. Croll to see the parties and satisfy them; he did go with them, and settled the amount with Mr. Laing, and the parties left us and have not returned to us since. The company's engineer there means Mr. Croll. I still adhere to what I told Mr. Lloyd, I never made use of the words "tilt the meter" to Mr. Schomberg. I state that most distinctly on my oath. In the ordinary business of the company I have said to the inspectors—"Go, and attend to this; satisfy the consumer." This is of rare occurrence, but I have done it, and have no doubt had conversations with Mr. Schomberg about satisfying consumers.

By the UMPIRE: I never had a conversation about tilting a meter.

By Mr. ARCHIBALD: I never heard from him or any of the inspectors that they had tilted meters. I should have reprimanded them at once. I know Hunt, and never heard from him that a meter had been tilted. He did not tell me that he tilted a meter, neither did I laugh and rub my hands, and say he had done right. I should rather have said he had done wrong. I know Messrs. Feast and Batty, provision merchants in Moorfields, and know they are customers. I do not remember Brittain or Hunt reporting that they had obtained permission to put up the meters. I should hear of all those large lightings in the ordinary way; and I will venture to swear that nothing to the effect of tilting the meter was ever said to me by Hunt. (*To be continued.*)

Miscellaneous News.

THE CORK CONSUMERS' GAS COMPANY.

The Fourth Half-Yearly Meeting of this Company was held on the 6th inst.—Mr. MAGUIRE, M.P., presiding, when the following report and accounts were adopted:—

Although the provisions of the Act under which your company is incorporated do not require that a statement of accounts should be laid before the shareholders more than once in the year, we have deemed it right to submit to you, at the earliest period possible, the revenue account of the company for the first six months during which your works have been in operation, together with a general balance-sheet and the profit and loss and capital accounts of the company.

We feel great pleasure in pointing to the success of the company's operations, which have exceeded our most sanguine expectations.

The whole of your permanent investment, including parliamentary, legal, and preliminary expenses, amounts to a sum of £39,863. 10s. 4d., being much below the original estimate, which comprised only 900 meters and services, instead of about 1331, the number fixed at the date of accompanying account. The additional outlay on this head, and for ammonia works, not originally contemplated, amounts to over £1700; you have, therefore, executed more work, and supplied many more consumers, at much less outlay than you anticipated.

An idea was industriously propagated that the leakage on your mains was more than sufficient to absorb all the profits of your undertaking. We have placed before you, in the revenue account, the total loss beyond your engineer's estimate which has been incurred on this head, which, as a necessary incident to the establishment of a large system of pipes, we have placed to the debit of capital. All this loss, it must be understood, took place in the first quarter, the leakage and condensation of the second quarter not exceeding the estimated amount. We believe that the amount of gas unaccounted for during the current half year will be still less than this proportion.

Your works are, we believe, inferior to none in existence, and have all been constructed in so substantial a manner, that the outlay for wear and tear and maintenance will be far below the average in similar manufactories.

An additional bench of retorts is in course of construction, in order to meet the requirements of the coming winter. The erection of another gasholder and tank has been postponed until next winter.

The service of the public lamps has given general satisfaction, and the quality of your gas has been universally approved of.

Although the accompanying revenue account of the company is very satisfactory, yet, taking into account the limited number of meters which could be supplied by your gas during the early part of the year when the consumption is greatest, and the daily increase which is taking place in this respect, we anticipate that the result of the current half year's working will be still more favourable for the shareholders. We are happy also to state that only six meters of this company have been supplanted by those of the United General Gas Company. Four out of these six cases took place under peculiar circumstances.

Since the date to which the accounts were made up, your directors have paid off the sum due to the Provincial Bank, having themselves advanced a sum of £10,000. A mortgage has been executed to trustees to secure them for this advance.

Since the period referred to, the whole of the outstanding shares of the company have been taken up. The whole of the share capital which the directors are at liberty to issue, viz., £40,000, has now been allotted, and without the consent of the shareholders the directors can issue no other shares, except a few which are subject to forfeiture in the event of the non-payment of arrears due. The necessary notice of forfeiture has been issued.

The issue of these shares will enable us to pay off outstanding liabilities, and will place at our disposal so much subscribed capital that it may be possible to carry on the business of your undertaking without exercising the borrowing powers with which your board has been entrusted.

As the capital now at the disposal of the directors is amply sufficient for the requirements of the company, and as the profit and loss account shows a balance of £1367. 17s. 5d., after paying interest and providing for allowances and bad debts, we recommend that a dividend at the rate of £4 per cent. per annum be declared. A sum of £600 will provide for this dividend, leaving nearly £800 to meet not only depreciation on works, meters, and plant, but any contingency which may possibly arise.

In conclusion, we have heartily to congratulate you on the remarkable success which has attended your undertaking—a success which is in a great measure to be attributed to the determination with which the citizens of Cork have resisted the great temptations which have been held out by your opponents, and the staunch fidelity with which they have stood by a local capital in native enterprise.

CAPITAL ACCOUNT, JUNE 30, 1858.

Dr.				*Cr.*			
To share capital, 12,000 shares	£60,000	0	0	By unappropriated shares 1437	£7,185	0	0
Deduct 4000, not to be issued unless by resolution of shareholders	20,000	0	0	Arrears on registered shares 6563	2,642	9	10
	£40,000	0	0	8000			
				Payments on account of registered shares	30,172	10	2
	£40,000	0	0		£40,000	0	0

REVENUE ACCOUNT, FOR HALF YEAR ENDING JUNE 30, 1858.

Dr.				*Cr.*			
To coal and cannel carbonized	£2,179	8	5	By gas rental, for half year ending June 30, 1858	£2,193	6	8
Wages	693	1	0	Public lamps	1,958	15	10
Public lighting	273	16	8	Coke and other residual products	1,151	5	9
Lime	53	9	2	Preliminary expenses for extra leakage incurred in testing and stanching mains and attaching services	175	19	1
Wear and tear	74	18	11	Ammonia manufacture	22	15	3
Salaries, including collection	495	0	0				
Rents, rates, taxes, and insurances	133	8	0				
Stationery and printing	21	18	11				
Advertising	20	16	5				
Office expenses, including stamps, postages, clerks and messengers, car hire, &c.	60	3	9				
Balance to profit and loss	1,586	1	4				
	£5,502	2	7		£5,502	2	7

PROFIT AND LOSS STATEMENT, FOR HALF YEAR ENDING JUNE 30, 1858.

Dr.				*Cr.*			
To reserve for bad debts and allowances	£ 109	13	4	By revenue account, profits in trade, half year to June 30, 1858	£1,586	1	4
Interest	108	10	7				
Balance, profits undivided	1,367	17	5				
	£1,586	1	4		£1,586	1	4

BALANCE-SHEET, JUNE 30, 1858.

Dr.				*Cr.*			
To capital account for amount received on account of calls	£30,172	10	2	By parliamentary and legal expenses	£1,445	6	8
Interest received from Provincial Bank	57	0	9	Engineering and superintendence	1,510	12	10
Balances due to sundry persons	6,795	0	11	Advertising, stationery, and printing	363	4	9
Ditto due the Provincial Bank	9,232	16	10	Salaries	285	0	0
Profit and loss—profit undivided	1,367	17	5	Rents, insurances, and taxes	140	2	6
Balance reserved for bad debts and allowances	109	13	4	Office expenses	239	2	11
				Preliminary expenses	423	2	7
				Office furniture and fixtures	87	6	8
				Mains	11,098	5	9
				Main-laying, service-laying, and paving	4,588	17	6
				Works	11,661	11	0
				Services	799	11	2
				Apparatus and tools	164	12	7
				Public lighting	3,356	18	2
				Meters	3,029	12	6
				Main-cocks, unions, &c.	89	17	4
				Ammonia works	457	19	4
				House repairs and alterations	97	6	1
				Land purchase	25	0	0
				Permanent investment	£39,863	10	4
				Sundry debtors	3,608	19	11
				Cash on hand	34	1	3
				Stock in trade, including coals, coke, and other residuals, mains, meters, services, &c.	4,228	7	11
	£47,734	19	5		£47,734	19	5

UNITED GENERAL GAS COMPANY.

The Half-Yearly General Meeting of this Company was held on Tuesday, the 7th of September, at the Offices of the Company, 6, Austin Friars—J. O. HANSON, Esq., in the chair.

The SECRETARY read the advertisement convening the meeting, the accounts, and the following report:—

Gentlemen,—In compliance with the provisions of the company's charter, your directors have convened this half-yearly general meeting, and, on laying before the proprietors a report of the last half year's operations, it will be seen that our profits are £5697, being £3290 less than the corresponding period of 1857, and £1442 less than the profits of the past half year.

The principal causes which have led to this diminution in our profits are, falling off in rental and products, both at Dublin and Cork, from reduction in price, amounting to upwards of £6000; notwithstanding which, your directors have been enabled, by active reduction in working charges, cheaper contracts in coals and freights, together with a vigorous economy in every branch of the establishment, to overcome this heavy deficit in revenue to the extent of £3000.

At Dublin several extensive additions and alterations of the works referred to in our last report are rapidly approaching to completion.

The new 24-inch trunk-main has been entirely laid from the works, and connected to the pressure-station at a distance of 1200 yards, together with considerable extensions of mains of increased calibre, and various districts of the city.

The retort-house and chimney are complete. The new apparatus therein will be ready for gas manufacture by the 1st of October next.

A second large telescope gasholder, of 100 feet diameter, is in rapid progress of construction, the tank being almost complete, and is expected to be ready for the reception of gas by next December. This will afford additional storage for upwards of 500,000 cubic feet.

When these improvements are entirely concluded, we may congratulate the proprietors on being possessed of a plant second to none in the kingdom for appearance and efficiency in gas operations.

The auxiliary works at Kingstown, not required at present during the summer, are in a satisfactory condition for resuming the supply in the ensuing season; and we are now fully prepared to meet every demand that may be made upon us by this rapidly-increasing and highly-respectable neighbourhood.

A deputation of directors have recently returned from visiting the stations, and they report much in favour of the various enlargements of the Dublin works, the combined results of which additions may fairly be anticipated to yield considerable benefits for the future, effecting economy in manufacture and improvement in the distribution of gas.

Thus this important station will, we hope, by better methods of working, be enabled to meet the intended reduction in price on the 1st of January next.

At Cork we have obtained during the last six months several public establishments, and some private customers have since returned to us, whilst we have lost comparatively few.

The quality of our gas continues, on all occasions, much above the parliamentary standard.

The proprietors may rely on every vigilance being used and economy exercised; and we trust a perseverance in our present vigorous measures will ultimately ensure success.

At Limerick our rental has increased, and the extension of mains in the North Circular Road has been productive of business equal to our expenditure.

In our last report, we mentioned that the corporation of Limerick had called upon us to tender for the public lighting of that city, and although our tender was much lower than the price they were charging the ratepayers, it was rejected without any reasons being offered. The result, however, was a considerable reduction in the charge previously made for the public lighting by the local gas committee.

No outlay will be required at Cork, and at Limerick only a moderate sum for renewing and altering the roofs of the retort-house and coal-stores. The proprietors will therefore see, that, beyond the general extensions of mains at all the stations according to their several requirements, no particular outlay will be called for, the recent additions and improvements being sufficient, as far as we can anticipate, for a lengthened period.

The directors have the pleasure of recommending the proprietors to declare the same dividend as before out of the profits of the past half year of 12s. 6d. per share, free of income-tax, the surplus to be carried to the stations contingency account as usual.

Three of your directors, Mr. Hanson, Mr. Magan, and Mr. Nicholson, and Mr. Godfrey, one of your auditors, go out of office this day by rotation, and, being eligible, offer themselves for re-election.

The CHAIRMAN then rose, and said: Gentlemen, the accounts of the company have been opened for the inspection of proprietors several days in the office. Many gentlemen may have availed themselves of the opportunity of looking into them, but there are other proprietors present who may not have had that opportunity; and I therefore think it may be interesting to them if I briefly go into the accounts, stating what have been the operations of the company during the past half year, and showing the actual position of the company according to our balance-sheet. At the last meeting, a proprietor asked the chairman what prospect we had of paying the same dividend this half year as we did then; and the chairman replied, that, to the best of his judgment, he thought we might rely upon the same dividend this year, and after that we might hope for better dividends. I am glad to find that expectation has been realized, and although the surplus after paying that dividend is not large, yet, upon a comparison of the accounts, if we take into consideration the credit for the surplus of coal which it is stated to us we had on hand at Dublin on the 30th of June, the surplus would have been nearly £900, compared with £1514, which was the surplus on the last occasion, therefore showing a falling off compared with December of about £600 only. Reference is made to the falling off in the rental and products. The proprietors must bear in mind that, comparing the accounts with those of 1857, the prices of gas at all the stations have been considerably reduced. It cannot, therefore, I think, be a matter of surprise that there has been a considerable falling off in the rental and in the products. The falling off in the rental and products together is, as the report states, about £6000; but I am very happy to say, on the other hand, in looking through the account, there is a very considerable saving in every charge, except in one solitary instance, which is the account for wages at Dublin. Those savings amount to upwards of £3000; and if you deduct this saving from the falling off in the rental, we get the result mentioned in our profit and loss account. Those are the operations of the last half year. (Hear.) I will just refer to our balance-sheet. If gentlemen have had an opportunity of looking into it, they will find that since the year 1849 our permanent investments stand precisely as they did, notwithstanding we have laid out in improvements at the different stations since that period an amount of upwards of £40,000. (Hear, hear.) I think that is a very good answer to a question that was put to the chairman at the last meeting by a very respected proprietor, Mr. Stanford, who had been looking into our affairs. (Hear, hear.) He asked why our shares were so depressed? The answer is quite easy: that if we lay out our money in improvements in our stations, we have not so much in hand to divide as profits. We think that our first duty is to take care of our stations, that they do not fall into decay; to improve, to enlarge, and extend them; and if Mr. Stanford had been present, he would, I think, have been quite satisfied with the statement I am now making. There is another item in the balance-sheet of a very satisfactory nature, and that is the credit we take for the cost of our meters. We have at least 8900 meters, and they stand in our balance-sheet at a cost of 7s. 6d. each meter. Now, that is a very low cost for meters. (Hear.) There is another very important point to be considered in our balance-sheet, and I think it will contrast very favourably with other balance-sheets. We have a very large amount of resources. We have different balances at our bankers of no less than £3567; we have £10,000 stock which was, if I recollect rightly, bought at 93. We have upon deposit with the London and Westminster Bank £21,000, giving us at the present moment available assets to the amount of £33,751. Therefore, the proprietors will see that on the other side of the account, although there is £10,000 set apart as the working capital of the company,—which was agreed to by the proprietors about a year or a year and a half ago,—that that £10,000 has not been broken in upon. (Hear, hear.) We have our dividend at the present moment at our bankers. We have an amount set apart for the stations contingency-fund at our bankers; and, therefore, I think, however severe the struggle may be at Cork, and whatever temporary inconvenience we may experience, and whatever may be the amount of outlay which we are called upon still to make for the large extension now going on at Dublin, the proprietors will feel satisfied we have ample means to meet it. (Great applause.) Having disposed of our balance-sheet, I will merely refer to Dublin. A deputation has lately returned from Ireland, and they give a very satisfactory report of the progress of our extension of works at Dublin, which are very important ones. (Hear, hear.) They consist of a new retort-house and a very large 24-inch main running for 1200 yards. We have the tank and gasholder in a state of great forwardness, and we expect to have all these works in good order against the present winter; and when these extensions are completed, I fully accord with the report of the deputation that we shall have our stations in a perfect working order. (Hear, hear.) We hope, therefore, that we shall not be called upon for a lengthened period for any other considerable outlay. We have besides, auxiliary works at Monkstown. (Hear, hear.) They are small works at present, but they are very useful to us in the winter. We have not used them this last summer, the extra demand being only during the winter months, for when we take the great bulk of our gas from Dublin to Kingstown we are exposed to a very considerable leakage, and therefore we think it more economical to have these works there to assist us. I think we may look forward to a very considerable saving in the wastage account—(hear, hear)—which has always been a heavy one. At Dublin we extend over 110 miles, and of course gas travelling so great a distance is subject to extensive leakage. I do not dwell much upon affairs at Cork, because, according to our Act of Parliament, this next half year we shall have to deliver in a distinct, precise, and detailed account for the city of Cork. All I can say is this: that our customers, instead of decreasing, have increased. (Hear, hear.) The illuminating power of our gas is very superior to the standard fixed by Parliament. About Limerick I have nothing very particular to say, excepting that we have fully maintained our position notwithstanding all the influence the corporation brought against us. I do not think it necessary to add anything further, except to say that if any proprietor wishes for the slightest information we shall be most happy to give it to him. We have no secrets,—in fact, we seek for inquiry. I have endeavoured to lay our account before you in the plainest and simplest form I can, and if any proprietor be desirous of knowing anything further, I shall be most happy to afford him all the information in my power. (Applause.)

Mr. WHITBY inquired whether there were any time contracts made with the inhabitants at Cork?

The CHAIRMAN replied that all contracts terminated when the price was reduced, though some contracts had since been entered into with public establishments.

The leakage having been inquired into by Mr. PERRY,

The CHAIRMAN replied that it was still high, but that the anxious attention of the board was directed to this important subject.

Mr. J. BOODLE: I have much pleasure in moving—"That the report and accounts now read be received and adopted."

Mr. RHODES: I second that; and I am very glad to find, Mr. Chairman, that my brother shareholders generally are holding their shares, and not disposing of them with any fear. They seem to have faith, like your humble servant, in this company; and the report and accounts now read this day, I think, will give a greater stimulus and satisfaction to the proprietors in looking forward to better days. (Hear, hear.) There, however, has been a report out of doors that though you charge 2s. 6d. for your gas at Cork, and the other company charge 4s. 6d., your customers are still leaving you, and going to the other company. I am very glad to hear from your report to-day that the fact is quite the contrary. Why I say the shareholders are holding their shares is, that I am waiting in the market to buy some, but I do not find them come in. ("Hear, hear," and a laugh.)

The resolution passed unanimously.

Mr. VANDEWALL: I have to move—"That a dividend of 12s. 6d. per share, free of income-tax, be declared out of the profits of the last half year." I think that we, as shareholders, may congratulate ourselves on the energy and ability that have been displayed by the directors generally in bringing about so good a result. (Hear, hear.) When we looked the last half year at the difficult position in which the directors were placed by this competition, and saw that the enormous reduction from 4s. 6d. to 2s. 6d. must naturally, in all human probability, affect us much more severely than it appears to have done, we must be sure that it can only have been by increased good management that we are enabled to receive a 12s. 6d. dividend. (Hear, hear.) I think also we may congratulate ourselves upon our future prospects, that we have seen the lowest point, and that things will now grow better. (Hear, hear.)

The resolution having been seconded, passed unanimously.

The CHAIRMAN, in answer to a proprietor, stated that the dividend would be payable on the 4th of October.

Captain SHEA: Gentlemen, I do not think I need say anything upon the motion that I am going to propose, which is to recommend to you the re-election of our worthy chairman as one of our directors. (Hear, hear.) I think we have every reason to believe that the chairman is worthy of our entire confidence. (Applause.)

Mr. PERRY: I second that motion with much pleasure. I believe that every gentleman present, and any gentleman who has ever had an opportunity of hearing our worthy chairman, must have been perfectly satisfied with the kind, the truthful, the honest, and the upright manner in which he has brought forward everything relating to the affairs of the company. (Great applause.)

The resolution passed amidst loud cries of "All, all!"

Mr. Magan and Mr. Nicholson were re-elected as directors, and Mr. Godfrey was re-elected as auditor.

The CHAIRMAN: Gentlemen, I can assure you that I feel very highly the compliment you have paid me. I have now been a director of this company many years, although, I believe, not quite so long as Mr. Magan and Mr. Nicholson. We have seen some vicissitudes, but I believe there is a good prospect still before us. I concur with the honourable proprietor, who expressed his belief that we had seen our worst days. (Hear, hear.) As long as you please to place confidence in your direction, and we all work harmoniously, it cannot fail to ensure the future prosperity of the company. On these grounds I feel very much obliged to you for the kind way in which the motion was received. (Applause.)

Captain SHEA: I am sure the proprietors will agree with me that not only the chairman, but the directors generally, are entitled to our thanks for the manner in which they have conducted the affairs of the company during the past half year; and I have much pleasure in moving a resolution to that effect.

The resolution was seconded, and passed by acclamation.

Mr. HUDSON: I beg to thank you most sincerely for the kind way in which you passed the vote of thanks to the directors. We are always anxious to do our duty; and whilst we have such a chairman to act with us, I am sure we shall always be found at our post, and I hope efficiently working for your benefit. (Applause.)

The meeting then separated.

THE MANCHESTER GAS-METERS.

At a Special Council Meeting, held at the Town Hall, Manchester, on Wednesday, the 1st inst., Alderman SHUTTLEWORTH moved the adoption of the following report from the gas committee, relative to Mr. Crosley's statements before the Parliamentary Committee on the Metropolitan Gas Supply, in respect of the use of high-spouted meters:—

Your committee have had their attention directed to certain evidence given on the 22nd and 29th June last, by Mr. William Crosley, before a Select Committee of the House of Commons, on "The Metropolitan Gas Supply." In the evidence given on the 22nd of June, Mr. Crosley stated that "the Liverpool Gas Company gave more gas than Manchester for the same nominal quantity,—that he (Mr. Crosley) believed the Liverpool measure was right according to Act of Parliament, and that he considered the Manchester measure, therefore, was too small." In a subsequent portion of the evidence Mr. Crosley stated—"I have furnished meters to both Manchester and Liverpool, but only to a small extent to the former. The meters to both would register precisely the same cubic foot of gas as regards the supply from London; but it does not follow that when they got to Manchester and Liverpool the same report would be made upon them. For instance, I believe a meter pronounced to be correct by the Liverpool Gas Company, and also by the corporation tester there, would not agree with the gasholder or the testing apparatus at Manchester. The question is, which measure is right? If Liverpool is right, and Manchester does not agree with it, Manchester cannot be right."

With reference to Mr. Crosley's statement, your committee report, that upon careful examination of the meters obtained from Messrs. Crosley and Goldsmith (which, as Mr. Crosley states, would exactly correspond in their measurement with those supplied by him to Liverpool), it was found that, as compared with those ordinarily supplied by your committee to the consumers in this city, Messrs. Crosley and Goldsmith's meters registered against the consumer; or, in other words, gave to the consumer less for a cubic foot of gas than the meters now in use by your committee.

With the view of ascertaining from the meter manufacturers the standard adopted by them with regard to the meters supplied to your committee, application was made to Messrs. Parkinson and Co. for information upon the subject, and the following is their reply:—"There is a slight difference between the standard we have always worked to, which is 1000 ounces, or 62·5 lbs. avoirdupois weight of water to a cubic foot, and the standard according to Act of Parliament, which is 62·321 lbs. avoirdupois of water to a cubic foot; which makes ours about one-third of one per cent. larger than the Act requires, and that in favour of the consumer."

In the evidence given on the 29th of June, Mr. Crosley gave an extract from a report made by him to your committee on the 15th of January last, stating the results of his investigation of 36 meters working in this city, which were taken indiscriminately over a large district, and all made by one firm, Messrs. Parkinson and Co., or their predecessors; 35 of which, in consequence of being overfilled with water, were registered against the consumer, on the average 4 per cent., and one meter 35 per cent. [See Mr. Crosley's Evidence in JOURNAL OF GAS LIGHTING, p. 414.]

With regard to this statement, your committee have to report that Mr. Crosley, having refused to give the names of the consumers whose meters had been so examined, but having stated the districts in which they were situated, your committee, with the view of testing the accuracy of the statement, directed a competent officer, entirely unconnected with the general inspection of meters, to make an examination in the districts mentioned by Mr. Crosley, and, accordingly, 33 of the same description of meters were examined. It was found that, out of such 33 meters, 11 were correct, 15 were deficient of water, and registering in favour of the consumer, and 7 were overfilled with water; of these 7, one had been recently and very slightly overfilled by the servant of the committee, and the other 6 had, according to the information given by the consumers, been watered either by themselves or by persons in their employ; the general inspection showing a registration in the proportion of rather more than two in favour of the consumer to one against him.

The possibility of overfilling the meter in general use is well known to all who are acquainted with the principles of its construction; but your committee have taken especial care that the officers selected to inspect the meters were proper and intelligent persons, and such officers have been supplied with printed instructions, in order to secure due care and exactness.

It has been the invariable practice of your committee to supply consumers, at cost price, with meters of the most approved construction; and your committee have always been solicitous to adopt any improvements which have from time to time been submitted to their notice.

Your committee are not aware of any construction of meter which is entirely free from objection, but they have now under their consideration several professedly improved meters, which your committee will carefully test, with the view of securing to consumers any advantages which may be proved to result from their use.

Alderman SHUTTLEWORTH, in moving the adoption of the report from the gas committee, said it had been drawn up during his absence, and the gentlemen who had compiled it had purposely and rightly confined themselves to a brief notice of the facts which contradicted the general allegations of Mr. Crosley, which he made in his evidence before the parliamentary committee. He should follow their example in avoiding extraneous matter, because he was satisfied that the report was amply sufficient to enable all parties who were conversant with the subject to come to a decision respecting the question. There was no difference of opinion as to the importance and desirableness, under the present circumstances, of introducing as perfect a meter for ascertaining the quantity of gas which was served to the consumers as it was possible to obtain. They had been specially desirous, both with regard to superintendence and the meters themselves, to secure the consumers against any overcharge. It would be seen by the report which he had the honour to present, that the meters which were most commonly used in this town were meters which, according to the statement of the manufacturers, were constructed upon a principle which gave as a cubic foot the space which was occupied by 62½ lbs. of water. Now the exact cubic foot, according to the decision of Acts of Parliament and public reports, was less than 62½ lbs., so that the meters which were used in this town had a margin between 62½ lbs. and 62 lbs., and less than ½ lb. This was a security which the committee had been glad to avail themselves of, so as to avoid the possibility of any injury to the private consumer. In furtherance of the same object, he had also to state that the committee had been most special and stringent in their instructions to their servants to attend particularly not only to the general watering of the meters, but to attend to them in such a way that the meters should not be watered to such an extent as would, in any respect whatever, interfere with the interests of the consumers. That such was the case he fancied would be admitted when he read the printed instructions to the superintendents upon this subject. Alderman Shuttleworth read these instructions, which contained the words, "great care being taken not to overfill them." This was urged upon the inspectors in order that, so far as the discharge of their duty was concerned, it should be so discharged as that the consumer should run no risk whatever of being overcharged. The meter which they used was constructed in such a manner that there was a compensating principle to meet the irregularities which were incident to the meter from the evaporation of the water. The evaporation of the water would alter its relation to the level line, and as the water fluctuated either above or below, the supply of gas would be more or less than the quantity of gas which was registered. To meet this difficulty an arrangement had been made by the manufacturer of meters which compensated it. The meters were made so as to register, when recently filled, about 2 per cent. against the consumer, but as the evaporation proceeded and the water-line was approached, the excess against the consumer diminished, and as the evaporation still proceeded the water sank below the water-line to a corresponding limit, so as to supply the consumer with a quantity more than the registration, to the equivalent of that which he had been previously charged with above the quantity supplied. This was an ingenious and a useful course, and would be a correct register provided it could be known at what exact period the average would be strictly produced. This, however, could not be done exactly, but it was done to all practical purposes. Whether this was a satisfactory condition or not, it was a condition which there was no possibility of avoiding; it was the only contrivance which science and ingenuity had hitherto applied to the manufacture of meters. The report stated that the committee were not aware that at present any meter which was strictly correct existed. No such meter had been brought under the notice of the committee. They had been charged with deception. Mr. Crosley in his evidence gave a list of thirty-six meters which he said he had examined. Mr. Crosley pertinaciously refused to enable the committee to investigate the cases that were included in his list—(hear)—and would give them no information which would enable them to examine his statements. He did, however, intimate the districts in which he said those cases existed. Into those districts they sent one of their most intelligent officials, without the slightest intimation as to the purpose for which they wished him to make the examination. He examined and reported upon thirty-three cases; and the result of that examination was stated in the report. The aggregate discrepancies found were quite within the commercial limit which he had endeavoured to explain. Mr. Crosley had put forward his statement in such a way as to create an impression that the difference between the quantity registered in the cases that he examined and the actual quantities varied in certain per centages. He stated that they varied from 1 to 35 per cent. Now, 35 per cent. was so enormous an inaccuracy, that with respect to that particular case, and with respect also to another case, in which he said he found that there was 27 per cent. difference, that, taking it for granted the statement was correct, it must be a matter of certainty to any person conversant with this subject that such a discrepancy could not take place except from some accidental circumstance, something or other which, if Mr. Crosley would have afforded them the opportunity of investigating, they would have shown to have been an accident, which, in all fairness, ought to exclude those particular cases from being introduced into an estimate of averages. He should treat those two cases, therefore, as probably admitting of being accounted for, and as being entirely exceptional. He left those out, and added up all the others, and the result was an overcharge on thirty-four meters, according to Mr. Crosley's statement, averaging 2 1/7 per cent.; the commercial limit, gentlemen must observe, was 2 per cent., which was a mere modicum above the commercial limit. But that was not all. In the thirty-six meters he professed to have examined, he said there were twelve which were supplying gas in greater quantity than was charged, but he did not say how much more. (Hear.) There were twenty-four which were supplying less. This reduced the average difference of the supply to 1 1/10 per cent. Now, this was the inevitable condition of using the best meters that there was the opportunity of obtaining. There was in the best meters a compensating arrangement, and it would be impossible, according to the present construction of meters, to have any meter that would not be unjust either to the consumer or to the producer of gas unless it had this compensating arrangement. In conclusion, Alderman Shuttleworth vindicated the gas committee from the charges made against them.

Councillor M'GILL, in seconding the motion, said that soon after Mr. Crosley introduced his meter to the committee, a number of them were ordered by the committee, and the public had had the opportunity of purchasing either Crosley's or Parkinson's. The committee made no profit whatever upon the sale of meters, and the public could have Crosley's if they were content to pay a price for it, which, as regarded the smaller meters, was about 40 per cent. in excess of that charged for Parkinson's.

Councillor RUMNEY spoke of the possibility of the meters now in use being overfilled, which was the opinion of the most eminent gas engineers. He did not say that this was done with the knowledge of the corporation, and he did not think there was any need of virtuous indignation to clear them. If the corporation meters were liable to these inaccuracies, they ought not to be employed if a better could be obtained—(hear, hear)—because the people who used the meters were not instructed how to manage them, consequently they were liable to make errors; and these errors were always against themselves, because, when the water was above the water-line, it registered more gas than was consumed. Mr. Rumney read the following letter from Mr. T. G. Barlow, consulting engineer, Parliament Street, London, confirming Mr. Crosley's opinion that the Manchester meters were not accurate from being over-watered:—

Manchester, Aug. 23, 1858.

I have examined the four wet gas-meters indicated under the letters T, V, W, and X, in the report addressed to the gas committee of the council of the city of Manchester, by Mr. William Crosley, on Jan. 15, 1858, and I hereby certify that, without intercepting the passage of the gas through them, the three meters marked T, V, and X may be overfilled with water to a greater extent than they were found to have been actually filled when examined by Mr. Crosley, and that the effect of filling them with water up to the point they will bear without affecting the light, will be to cause them to register against the consumer to a greater extent than stated by Mr. Crosley in his report. The meter W is apparently a lower-spouted one than some others used in Manchester, as it will not bear overfilling so as to register much more than about 27½ per cent. in excess of the quantity actually consumed. I have also gone carefully through a series of experiments upon meters of the 3, 5, and 10 lights, of the make and construction used in Manchester, with the view of testing the accuracy of Mr. Crosley's report as to the effect produced upon the registering index by overfilling such meters, and I am quite satisfied that in these respects his statements are perfectly correct, and that these meters, when overfilled in the manner described by him, will register against the consumer in the proportions given in his report.

THOMAS G. BARLOW, Civil and Consulting Gas Engineer,
42, Parliament Street, London.

Mr. Rumney adduced the gas bill of a gentleman in Mosley Street to prove that his consumption of gas was a great deal more when his meter was watered by the corporation than when attended to by himself, though there was the same number of lights. Possibly no meter was perfect, but Councillor Simpson himself admitted that one of the meters referred to was not open to the same objection. He had told them that if any one would go into the gas office he would see practically that Mr. Crosley's meter did not give a fixed water-line, and that it was liable to variation, which, if not to the same extent, was uniformly in favour of the gas company. He (Mr. Rumney) applied at the gas offices, and Mr. Cleminshaw said he was not responsible for the statements of Councillor Simpson—(laughter)—and declined to give any verification or otherwise of the statement. Mr. Crosley's meter had been before them for two years, and he should like the council to hear Mr. Clemin-

shaw's report upon it. It was news that the consumer could have what meter he liked. The matter was of too much importance for them to be content with this meagre report, in which the statements of Mr. Crosley were confirmed to the very letter. He moved as an amendment :—

That the report be referred back to the committee, with instructions to them to engage the services of a competent and disinterested person, for the purpose of testing the accuracy of the meters now in use, and any others that may be submitted, with regard to their liability to error from overfilling and other causes.

He believed that there was such an officer in Liverpool, whose services were much used and valued. Surely it was not beyond the scientific skill of the present day to construct a meter which should not be liable to vary 60 per cent., as were those at present in use. (Hear, hear.)

Councillor GRUNDY seconded the amendment, and he did so the rather on account of an observation that had dropped from a member deprecating interference with what was called the independence of committees. He hoped the time would soon arrive when the council would not hesitate to take the supervision of committees. (Hear.) He for one, whenever he had the power and circumstances called for it, should not hesitate to make remarks upon the proceedings of any committee, not even when that committee was presided over, as it was in this instance, by one of the oldest and most venerable members of the corporation. (Hear.) He considered that the report was very unsatisfactory and very evasive. It seemed to confine itself mainly to finding fault with the meters of one particular maker, instead of meeting the objections that had been urged against the meter which was now generally in use. Perfection might be unattainable in meters, but that was a very different thing to the wide range of variation which now prevailed. It was evident that a large majority of the meters in this town were practically overfilled. Let any gentleman examine his house or office meter, and turn the side plug, and see if the water did not run out from being overfilled. He had done so that morning with his meter, and a considerable quantity of water ran out. ("Was the gas turned on?") The gas was partly turned on. ("That accounts for it.") He knew of cases where the result was the same with the gas turned off. Mr. Shuttleworth seemed anxious to take credit for the meters that registered against the gas company, but that was as bad as the other way. (Hear.) A meter could be got more correct than that now in use. A better meter had been submitted to the committee, but its existence was practically ignored. The gas committee, like all bodies that had long been accustomed to uncontrolled action, did not like to be told that they were not doing quite the right thing. He only wanted them to look at this in a fair spirit, and if a better meter existed, to adopt it. The public ought to be told that they could have Mr. Crosley's meter put up. He wished to put three questions to the committee. Was it not true that a meter could be had less liable to derangement from ignorance than the present? He believed that more than one-half of the meters were overfilled by occupiers from ignorance. He was lately ignorant of such a thing as a "water-line;" and, like many other persons, when his gas danced he used to put water into the meter, of course to the increase of his gas bill. (Laughter.) Was it not true that the meter now in general use was capable of registering falsely to the extent of 60 per cent.? He had seen it varying to that extent. Was it not true that practically the committee discountenanced the use of a more correct meter?

Councillor SIMPSON regarded Mr. Grundy's concluding remarks as very unjust, being directed against a public servant who was not present to answer for himself. The gas committee did not put in meters at all; the gas-fitters obtained what meters the public wanted. If Crosley's meter were wanted it could be had. The plumbers were quite aware of it. Mr. Crosley's meter was 40 per cent. higher in price, and that no doubt was a bar to its use. The gas committee did not set their face against any meter; their anxious wish had been at all times to supply the public with the best possible meter. Mr. Crosley was the last man in the world who ought to have become an accuser.

Alderman CLARK thought that the latter part of the amendment was not in order. He could not see the use of this discussion, except to advertise Mr. Crosley's meter. (Hear.)

Councillor CURTIS complained of the unsatisfactory nature of the report. He also had frequently filled up his meter with water. (Laughter.)

Councillor MC DOUGALL thought the questions put by Mr. Grundy ought to be answered.

Sir JAMES WATTS remarked that it was now past two o'clock, and many of them had engagements for that hour. No doubt the questions would be answered in the next report.

Councillor RUMNEY consented to withdraw his amendment, as part of his object had been obtained in having the matter discussed, and the motion was adopted.

Mr. Crosley has since addressed the following letter to the editors of the local papers with reference to this discussion :—

TO THE EDITOR OF THE "MANCHESTER COURIER."

Sir,—I suppose you will have a report of the proceedings of the meeting of the city council, on Wednesday last, in the *Courier* of Saturday; I must, therefore, urgently request, through your columns, that the public will abstain from forming any conclusion on this subject for a few days. The statements made by Mr. Alderman Shuttleworth and Councillors Simpson and M'Gill, at the council meeting yesterday (Wednesday), are so calculated to mislead, that I consider it absolutely necessary to prepare and circulate a full comment upon them, and this I will do the moment my present pressing engagements are fulfilled.—Yours,

Manchester, Sept. 2, 1858. WILLIAM CROSLEY.

EXPLOSION AT THE INDEPENDENT GAS-WORKS.—On Thursday morning last, between ten and eleven o'clock, an accident occurred at the Independent Gas-Works, Haggerstone, from an explosion of gas, whereby three of the workmen, who were employed in preparing to connect a valve from a new gasholder to the main outlet-pipe in the valve-shed, were seriously injured. A part of this shed is partitioned off as a store-room for the use of the pipe-jointers for their tools, clothes, &c., and is fitted with gas-burners and a stove, and one of the burners had been incautiously left lighted. On removing the blank flange to adjust the casting, the gas in the main escaped, and passed under the roof and over the partition, and, coming in contact with the light, exploded, and the three men employed were severely burned. Medical assistance was immediately procured, and, to insure the best treatment, they were removed to the London Hospital, where they are progressing favourably towards recovery. The injury to the premises is very trifling, being confined to replacing the slates on the shed-roof. The fire was speedily extinguished by the workmen of the factory. Several fire-engines were in attendance, but their services were not required, and none were permitted to enter the works, although greatly exaggerated reports of the nature and effect of this accident have appeared in some of the daily newspapers.

EXPLOSION OF GAS AT NOTTING HILL.—On Thursday, the 9th inst., the premises of Mrs. Maria Spickell, Hall's Terrace, Notting Hill, had a narrow escape of being burnt down. Owing to some defect in the gas-pipes in the back dining-room, the vapour escaped, and on the servant going in with a light it ignited, blowing the ceiling and doors down, beside doing other considerable damage. The engines of the Fire Brigade were promptly in attendance and extinguished the fire, but not until considerable damage was done. Insured in the Globe Office.

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Average Weight of Cast-Iron Gas-Pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle.	Wales.	Yorkshire, Derbyshire, and Staffordsh.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pig Iron, No. 1	4 10 0	2 14 0	3 0 0	4 0 0	4 5 0
1¼ and 2 inches Socket-Pipes	7 15 0	7 0 0	7 5 0	7 10 0	7 5 0
2½ and 3 " "	7 5 0	6 15 0	7 0 0	7 5 0	7 0 0
4 and 5 " "	7 5 0	6 10 0	6 15 0	7 0 0	6 15 0
6 in. and upwards "	7 0 0	6 5 0	6 5 0	6 15 0	6 5 0
Retorts, 1st fusion, hot blast	6 15 0	...	6 15 0	7 0 0	6 15 0
" 2nd " cold "	7 15 0	...	7 0 0	7 5 0	7 0 0
Tank Plates, ⅜ thick and above	7 5 0	6 10 0	6 15 0	7 0 0	6 15 0

WROUGHT-IRON TUBING,

Subject to 40 per cent. Discount.

	2 in.	1¼ in.	1¼ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 ft., per ft.	1 8	1 0	0 10	0 7	0 5	0 4½
" " " 6 in. to 18 in., each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-Pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows—wrought iron	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, wrought or cast	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
" with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Plain Sockets [Nipples	1 3	0 9	0 8	0 6	0 5	0 4
	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2 quart	15 0	14 0	13 6	13 0	12 0	—

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Whitwell Primrose	6s. 3d.	Boghead, at Leith	32s. 0d.
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Pelaw	6 9	Capeldrae, 1st quality	20 0
New Pelton, Peareth, South Pelaw, Washington Hutton, and South Peareth	7 0	" 2nd "	12 6
Pelton	7 9	Lesmahago, at Glasgow	25 0
Ramsay's Newcastle Cannel	16 0	" " Leith	27 6
		Arniston	22 0
		Wemyss	20 0
		Knightswood	18 0
		Pirnie	15 0

SUNDRIES.

Best Newcastle Fire-bricks	per 1000	60s. 0d.	
" " clay	per ton	12 0	
Cliff's Fire-bricks, at Wortley	per 1000	57 6	
Ingham's Fire-bricks, at Wortley	"	55 0	
Tough Cake Copper	per ton	£102 10s.	Foreign Spelter per ton £24 0s.
English Pig Lead	"	21 5	English Block Tin " 118 0
Welch Bar Iron, in London	"	7 0	Banca " 115 0
Tarred Rope Yarn	per cwt.	26s. 0d.	

FREIGHTS.

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Chatham & Rochester	5s. 3d.	Boulogne & Calais	£6. 15s. to £7 0s.
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Dover	—	Bordeaux	13 0
Dublin	7 9	Cadiz	£15 to 15 10
Exeter Quay	7 3	Copenhagen	8 0
Folkestone	5 7½	Dieppe	£7 to 7 5
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London	5s. 3d. to 5 6	Hamburg	£7. 10s. to 7 12 6
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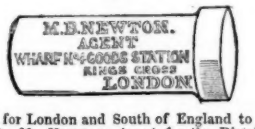

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Manufacturer of
IRON TANKS for Gasholders, Railway Stations, &c.
GASHOLDERS.—Extensive premises at Gorton, solely for the manufacture of Gasholders, and other heavy Wrought-Iron Structures.
GAS APPARATUS.—W. M. has an extensive assortment of patterns for Purifiers from 4 feet to 15 feet square, also round ones from 4 feet to 10 feet diameter; Scrubbers, Condensers, Washers, Columns, Girders, and Tripod Patterns, suitable for Gasholders, from 10 feet to 150 feet diameter, either Single-lift or Telescope. Contractor for Gas Works of any Magnitude. Designs, Specifications, and Estimates furnished.
WROUGHT and CAST IRON ROOFS for Railway Stations, Gas Works, Warehouses, and Sheds, prepared for Slates or for Corrugated Iron.
IRON HOUSES, either for Dwellings, Manufactories, or Public Buildings.
PIPES and VALVES, for Gas and Water, from 2 inches to 48 inches bore.

JOHN BENT, Manufacturer of GAS-METERS,
283, BELL BARN ROAD, BIRMINGHAM,
(Established 1830),
Begs respectfully to call the attention of Gas Companies, Engineers, &c., to his WET GAS METER, made upon the most improved principles, the most admirable materials, and warranted to register correctly.

CAST-IRON Retorts, Socket Pipes, with Syphons and all requisite Connexions, Lamp Columns, Wrought Iron Tubing, Valves, Street Lamps, Sight Holes, Furnace Doors, Ash Pans, Charging and Coke Shovels, Iron Pails and Coke Barrows, Cross Bars, Fire Pots, Pumps, Iron Borings.
PURIFIERS, CONDENSERS, and SCRUBBERS erected complete, or the materials supplied; with every description of goods in use by Gas-Works, in stock, on wholesale prices, at
LYNCH WHITE'S,
Old Barge Iron Wharf, Upper Ground Street,
LONDON.

TO GAS COMPANIES.
J. W. GRAZEBROOK, 75, Old BROAD STREET, LONDON,
Having applications for New and Second-hand Gas Apparatus, would be obliged by those Companies having Apparatus to dispose of, to send particulars. And Companies requiring Apparatus are solicited to apply.
PIPES, RETORTS, TANKS, GASHOLDERS, &c. on Shortest Notice.
STOURBRIDGE and NEWCASTLE FIRE GOODS, CONTRACTS TAKEN.

RICHARDSON and CO.,
ENGINEERS AND IRONFOUNDERS,
TUNNEL FOUNDRY AND SPRING GARDEN IRON-WORKS,
DUDLEY, near BIRMINGHAM,
Manufacturers of Gas and Water Apparatus, Steam-Engine Boilers, Single and Double Gasholders, Tanks, Bridges, Boats, Roofs, Valves, &c.

MR. WILLIAM RICHARDSON,
Consulting Engineer and Contractor,
DUDLEY, near BIRMINGHAM.

JOHN ROGERSON and CO.,
NEWCASTLE-ON-TYNE & MIDDLESBRO'-ON-TEES.
Wrought and Cast Iron Pipes, Cast-Iron Retorts, and all kinds of Foundry Work necessary for Gas-Works. Fire-Bricks and Clay Retorts. Gas Coals of every description. Pig, Bar, and Plate Iron.

LESMAHAGO GAS COAL.
JAMES FERGUSON and CO., Lessees of the Auchinheath and Craignethan Gas Coalfields (the most extensive and valuable in the parish of Lesmahago), respectfully intimate to the Managers of Gas-Works and Consumers of Gas Coal, that he is prepared to ship the best quality of the above well-known COALS at Glasgow or Leith; and also to deliver them at the railway stations upon, or connected with, the Caledonian Railway, to any extent which may be required.
Price, free on board, or delivered at the railway stations, may be learned by addressing James Ferguson and Co., Gas-Coal Works, Lesmahago; or J. H. Jones, 1, Poets'-corner, Westminster, sole Agent for London.
Shipping Agent for Glasgow:
MR. ALEXANDER STRATTON,
159, WEST GEORGE STREET.

FIRE-CLAY RETORTS.
JOHN SWARBRICK,
MANUFACTURER OF PATENT COMPOSITION CLAY RETORTS,
FIRE BRICKS OF EVERY DESCRIPTION, SHAPE, AND SIZE, &c. &c.
HIGHER EANAM, BLACKBURN, LANCASHIRE.
These RETORTS are generally used in the Gas-works of Preston, Accrington, Bury, Heywood, Middleton, Rochdale, Ratcliffe; the Mills of Messrs. Horrocks, Miller, and Co., Preston, &c. &c., and are unequalled in having afforded general satisfaction to those who have given these Retorts a trial.
To meet the increasing demand, the Works at Little Harwood have been greatly enlarged; and Gas Engineers who may favour with an Order may rely with confidence on their being promptly supplied with an article not to be surpassed in finish or durability.
PRICES MODERATE.

TO GAS COMPANIES, GAS PROPRIETORS, AND GAS ENGINEERS.
JOHN VICKARY
begs to call the attention of the above to his improved METALLIC CASE GAS-METER, an improvement which has met with entire approbation from the various Gas Companies and Engineers to whom he has introduced it, and acknowledged to be the greatest improvement that has been made since the year 1832; at which period a metal was introduced for the construction of the Drum, Syphon, and Float, capable of resisting any impurities arising from either gas or water, which has been found to answer every expectation; as, in repair, Drums of the above date are found in perfect and good condition, when the Outer Case, Valve-box, Inlet-pipe, &c., are quite destroyed and entirely past repair.
J. V. has introduced a coating or lining of the above metal in the Outer Case, Valve-box, Inlet-pipe, &c., thereby rendering the whole as durable as the Drum, as not a particle of tin plate is exposed to the action of either water or gas; and preventing the possibility of gas passing above the water line through the front into the body of the Case to the outlet unregistered, which frequently occurs. When the Meter has been in use for any length of time it is generally found that rust or decay takes place *above* rather than under the water line, which is only discovered when they need repair. Also the Inlet-pipe and Valve-box are generally found quite decayed, which cannot happen in the above improvement.
J. V. feels confident that the above will be found a most desirable and perfect instrument, as it contains all other improvements of utility that have been introduced up to the present time.
The most strict attention is given to the workmanship as well as the registration of every Meter, to render them perfectly accurate.
Station Meters, Governors, &c., made on the shortest notice, as well as Gas Cooking Apparatus of every description, Gas Baths, &c.
Meters sent at the lowest London prices.
Carriage paid to any part of England.
WEST OF ENGLAND GAS METER AND GENERAL GAS APPARATUS MANUFACTORY, 84, FORE STREET, EXETER.

FIRE-CLAY GAS RETORTS.

ESTABLISHED IN 1795.

JOSEPH CLIFF,

WORTLEY FIRE-BRICK WORKS, near LEEDS.

THESE RETORTS are unrivalled in excellence, being the BEST FINISHED INTERNALLY, and THE MOST CORRECT IN FORM, of any in the Kingdom. From the peculiar composition used in working up the face of the material, they are rendered unusually smooth, close, and FREE FROM SURFACE CRACKS, thus, in a great measure, preventing leakage and the adhesion of carbon to their interior surface.

To meet the yearly increasing demand of UPWARDS OF THIRTY SEASONS and to carry out the late improvements in the manufacture, the Premises have been re-erected and much enlarged, and Engineers may rely WITH CONFIDENCE on their orders being completed with a greater regard to despatch than by any other House.

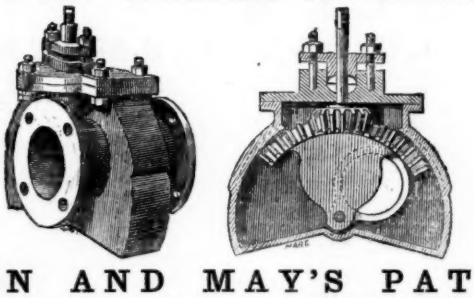
THE WORKS ARE WELL SITUATED

For EXPORT from the Ports of { LONDON, LIVERPOOL, HULL, MIDDLESBRO', HARTLEPOOL, and STOCKTON.

FIRE-BRICKS, LUMPS, GUARDS, TILES, AND CLAY OF THE SAME QUALITY.

M. B. NEWTON, London Agent, No. 4, Wharf, King's Cross Goods Station.

BEST AND CHEAPEST SLUICE-COCK.



BROWN AND MAY'S PATENT.

Above 3-inch diameter, price 10s. per inch. Brass face, 6d. per inch extra.

Can be taken to pieces without being removed from the line of Piping.

NORTH WILTS FOUNDRY, DEVIZES.

Wholesale Agents, Messrs. S. and E. RANSOME, 31, Essex Street, Strand, E.C.,
Where a Sample may be seen.

WILLIAM PARKINSON AND CO.,

(Successors to the late Samuel Crosley,)

COTTAGE LANE, CITY ROAD, LONDON,

Beg to announce that, in addition to the manufacture of GAS-METERS, they continue the manufacture of METERS for MEASURING WATER, SPIRITS, &c., commenced, under Patent in 1849, by the late Mr. William Parkinson.

These Meters are as simple and durable as the Gas-Meter, and as correct as that instrument in the registration of the fluids passing through them.

PADDON and FORD, Patent

GAS-METER AND APPARATUS WORKS,
GRAY'S-INN-ROAD, LONDON,

Manufacturers of WET and DRY GAS METERS, STATION METERS, GOVERNORS, EXPERIMENTAL APPARATUS, LANTERNS, &c. &c.

Contractors for the erection or alteration of Gas-Works; and every description of Apparatus required in Gas-Works supplied.

"ALL DOUBTS REMOVED."

DEFRIES' celebrated Dry Gas-METERS,

of which there are 80,000 in use in Palaces, Churches, Chapels, Royal Dock-yards, Club Houses, Public Offices, and other buildings throughout the Empire, the Continent, and Colonies.

His meter for 1500 lights, in use upwards of ten years at the Royal Italian Opera, until that building was destroyed by fire, was long afterwards dug out of the burnt ruins, then tested by the Chartered Gas Company and found inflexibly correct.

On the 9th of June, 1858, at the Western Gas Company, his meter for 150 lights, after considerable use, was doubted, and subjected to the most variable tests, from the full lighting down to a single jet, and in each case, as in numerous other instances, accuracy was finely indicated.

His two large meters at the Thames Tunnel have been in constant use day and night for upwards of twelve years (one continuation of dark hours), subjected to the wear and tear of 75 years, as compared with the ordinary hours of using gaslight above ground.

Gas Companies honouring Mr. Defries with their commands for his PATENT DRY METER, which has done so much service in simplifying the fitting up of gas, as well as checking surreptitious burning, will be guaranteed perfection for five years free of charge.

Defries' Prize-Medal Gas Baths, Gas-Cooking and Heating Stoves. The Polytechnic Gas Fire, with indestructible fuel, in daily operation (Saturday excepted) at the Office, 145, REGENT STREET, and the Manufactory, Euston Road, Fitzroy Square, LONDON.

LIVESEY FIRE-CLAY WORKS,

NEAR BLACKBURN, LANCASHIRE.

ORLANDO BROTHERS,

MANUFACTURER OF PATENT CLAY RETORTS,

AND EVERY DESCRIPTION OF

TUBULAR GLAZED SEWERAGE PIPES, BENDS, JUNCTIONS, ETC.

FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS.

WILLIAM INGHAM AND SONS,

WORTLEY FIRE-BRICK AND RETORT WORKS,

Near

Leeds.

W. INGHAM and SONS, having for many years been extensively engaged in the Manufacture of

RETORTS AND FIRE-BRICKS FROM THE CELEBRATED WORTLEY FIRE-CLAY,

beg to call especial attention to their RETORTS, which have for many seasons proved to be unsurpassed in quality by any in the Kingdom, their FREEDOM FROM CRACKS and the ADHESION OF CARBON rendering them worthy the attention of all parties interested in the making of Gas.

The Works are of such magnitude as to ensure the prompt execution of orders to any extent.

Estimates for Setting, or Bricklayers sent when required.

GAS OVENS IN SEGMENTS OF EQUAL QUALITY.

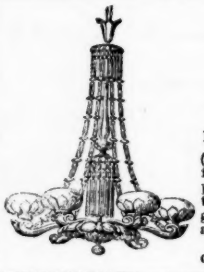
London Agents: CHRISTIE and CO.,—Wharf, 64, Bankside, Southwark, and Offices, 67, King William Street, City; and CHADWICK and AKEROYD, Willington Stone Wharf, Regent's Park Basin.

N.B.—*Export orders continue to have prompt attention.*

ALEXANDER WRIGHT,

GAS ENGINEER, MANUFACTURER OF GAS-METERS, GOVERNORS, AND EVERY DESCRIPTION OF GAS APPARATUS,
55, MILLBANK STREET, WESTMINSTER.
CONSUMERS' METERS at the List Price, with a Liberal Discount to Wholesale Purchasers.
THOMPSON'S BROMINE TEST, £1. 1s.—BROMINE, 3s. per Ounce.
BISULPHURET OF CARBON TEST, £2. 2s.
APPARATUS FOR DETERMINING THE HEATING POWER OF SAMPLES OF COAL AND OTHER DESCRIPTIONS OF FUEL, £5. 5s.,
INVENTED BY LEWIS THOMPSON, Esq., M.R.C.S.
REGISTERING PRESSURE GAUGE, Net Price, £8. Glass Shade, 10s. extra.
STATION METERS, PRESSURE GAUGES, PHOTOMETERS, SPECIFIC GRAVITY APPARATUS, &c.

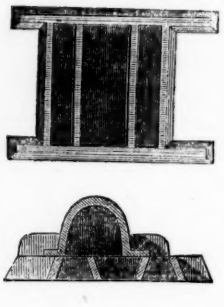
JAMES OAKES and CO.,
ALFRETON IRON WORKS, DERBYSHIRE,
AND
WENLOCK IRON WHARF, 20, WHARF ROAD, CITY ROAD, LONDON,
Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water Works, including best cold-blast Iron Retorts, Socket and Flange Pipes of all sizes, Bends, Branches, Syphons, Lamp Columns of various patterns, &c.
N.B.—Orders for Cast-iron Tanks, Girders, Columns, Cylinders, and all irregular castings, will have immediate attention.
CHARLES HORSLEY, Agent.
C. H. is prepared to carry out the warming and ventilation of public buildings, &c.; also civil engineering in general.

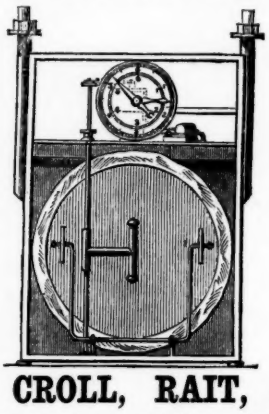


F. & C. OSLER,
44, OXFORD STREET, LONDON;
Manufactory—Broad Street, Birmingham—Established 1807,
MANUFACTURERS OF GLASS CHANDELIERS, GLASS LUSTRES, TABLE GLASS, &c. &c.
ELEGANT CRYSTAL GLASS CHANDELIERS, for GAS, from £4 upwards (Made from "REGISTERED" DESIGNS), with GLASS BRANCHES, &c.; suitable for DRAWING-ROOMS and BALL-ROOMS. The more extensive use of GAS in private dwellings has induced Messrs. OSLER to direct their particular attention to the manufacture of this class of articles—which, with a view to their general adoption, are offered at very moderate prices. Purchasers can select from a great variety of patterns, to which additions are being constantly made.
THEATRES, CONCERT, ASSEMBLY, AND BALL ROOMS LIGHTED BY ESTIMATE ON THE LOWEST TERMS.

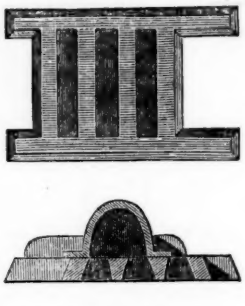
CROLL'S
PATENT IMPROVED DRY GAS-METER,

NEW VALVE.





OLD VALVE.



Manufactured by CROLL, RAIT, and CO., LONDON.
FACTORY—Blundell Street, near the Railway Station, Caledonian Road, N.
OFFICES—10, Coleman Street, City, E.C.

Messrs. CROLL, RAIT, and Co. beg to call the attention of Gas Companies to their Improvements in Dry Gas-Meters, which secure a steady light under all circumstances.

In forming the Valve-Seat of the Dry Gas-Meter it has hitherto been usual for the Bars to be equal in width to the openings; but, by the extent of the surfaces thus brought into contact with the Valve or Cover, it is found that fluid accumulates, and, during part of the motion of the Valve, partially closes the passage, thereby causing an oscillation in the lights.

An Improvement in the Manufacture now introduced and patented by Mr. CROLL consists of very considerably reducing the width of the Surfaces or Bars, as in the drawing of the New Valve, retaining only such width of bar as is necessary to secure correct measurement.

Another Improvement consists in the mode used of mixing and amalgamating the various proportions of Metals for the Valve, always taking care that the Valve-Seat shall be of an alloy considerably different to that of the Valve-Cover, by which the friction of the surfaces is materially lessened.

These Improvements remove at onee any liability to unsteadiness of light, and at the same time secure (from the Valve working more evenly) a greater certainty of accurate registration.

D. HULETT and CO., 55 and 56, HIGH HOLBORN, LONDON,
PATENTEES and MANUFACTURERS of the ONLY GOOD MERCURIAL GAS REGULATOR,
invite the attention of Gas Companies and the Trade generally to their Improved GAS-METERS, which they warrant equal to any in Quality, Workmanship, and Simplicity of Construction, and the only Meters from which Gas cannot be obtained without being duly registered.
MANUFACTURERS OF
GAS CHANDELIERS, GLASS LUSTRES, HALL LANTERNS, VESTIBULES, BRACKETS, PENDANTS;
DOUBLE CONE, ALBERT, SHADOWLESS, & EVERY DESCRIPTION OF BURNER, UNION JETS, BATSWINGS, ETC.
IMPROVED FULL-WAY CARTER'S VALVES (much approved of);
GAS-STOVES, and every article connected with Gas Apparatus.
CAST & WROUGHT-IRON PIPE, BLACK & GALVANIZED. COPPER, TIN, BRASS, & COMPOSITION TUBING.
D. HULETT'S IMPROVED SERVICE CLEANSER
for clearing out Mains, Services, and Interior Fittings—60s. net.
Boyle's Patent Silvered Glass Combination Reflectors and Outside Lanterns.
Sole Manufacturers of Church and Mann's Photometer.
Large Pattern Books, with every description of Gas-Fittings, Chandeliers, &c., with complete Book of Prices, 12s.
Price Book sent free, on receipt of two postage stamps.

London: Printed by WILLIAM BOUGHTON KING (at the office of Joseph Clayton, 17, Bouverie Street, Fleet Street); and published by him at No. 11, Bolt Court, Fleet Street, in the City of London.—Tuesday, Sept. 14, 1858.